

VOLUME X

The

NUMBER 11

A.T.A. Magazine

OFFICIAL ORGAN OF THE ALBERTA TEACHERS' ALLIANCE, INC.

MAGISTRI NECQUE SERVI



JULY-AUGUST, 1930



EDMONTON NUMBER

INERT IDEAS AT A PREMIUM

THE craze for general culture has produced a curriculum of four or five subjects pushed simultaneously up to a fairly high degree of attainment. Diffusion of interest stifles the keen curiosity of the normal child and creates in many a sense of failure or inefficiency. Interest in a subject can only be sustained by allowing a great deal of time for it and by a leisurely pursuit. The problem is to select for each pupil a region, however limited, in which he can attain some excellence and can acquire that sense of doing something well which in the centers of life is far more potent than culture.

Education is not merely a problem of knowledge which can be solved by the implantation of inert ideas—that is, of ideas not energized, not utilized, not enjoyed. But all the machinery of public administration is directed towards producing a good average of MEASURABLE efficiency—that is, of efficiency assessed by the measurement of inert ideas.

—PROFESSOR A. N. WHITEHEAD

Inert ideas are at a premium. To implant them is the cheapest way of giving what looks like a liberal education. But inert ideas are a blight on the mind and on the individual judgment. A liberal education should make us sensitive and keep us CREATIVE. Unless it keeps us creative it is disabling. The more widely we spread the disabling kind of education, the more we weaken intellectual and moral power.

—From a lecture on "A Liberal Education"—SIR MICHAEL SADLER.

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The A.T.A. Magazine



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VOL. X

EDMONTON, JULY, 1930

No. 11

Gaps and Pauses

H. R. LEAVER, M.A., Edmonton

WE regard Space as the stuff left over after the creation of a universe, and a Pause as that unoccupied by event. Not much attention has been paid to these, so busy have the scientists and historians been on the consideration of more ponderable matter and more weighty happenings. The 20th century has, however, revealed the activities of gaps and pauses, and whether it be in the form of radio, of the violet ray, or of secret diplomacy, the significance of the rarer medium is at last coming to be understood.

In education, we are approaching a period where leisure is considered as potent a factor as employment. A Time-Gap between periods of study is taken by great educationists as extremely important. We think we are driving educational theory, but really we are merely sniffing at its heels. Two years ago we were complaining about loafers; today, the so-called loafers are employing their leisure, the word leisure signifying an attenuated form of employment. We find this well illustrated in the affairs outside the schoolroom. Take the Great War, for example. History regards this as a concentrated event, and the periods before and after as rarefied forms of the same event. If one were to examine any happening in human affairs, it would be found that the pauses are not merely empty gaps in time, but rarefied forms of the actual occurrence. If we follow this truth to its logical conclusion, we find that study in its concentrated form in the classroom, is not more important, but rather less so, than the attenuated variety occupying the leisure period. The endeavor of a teacher to exclude pauses and gaps is a mere waste of valuable energy.

One other aspect of this question is found in the discovery that nothing is continuous, and nothing is stable. This may seem a contradiction of the former considerations, but a word will explain. The Quanta Theory in Physics shows that energy does not flow continuously but in little packets. It gathers head, and then bursts as it were. Explosion is characteristic of life. The continuity is in the series, preparation and explosion. Education has been concerned with the explosions and not with the gatherings. Examinations and tests are explosive dissipations following a period of preparation. In the elementary school the series is more rapid than it is in the high school for the simple reason that the time of adolescence is, as the word implies, a time of prepara-

tion, and one should not expect concentrated effort. There is a rather long Time-Gap at this period of life, and the pity of it is that teachers do not regard mental life as a series of rarefactions and condensations, proceeding in a wave-like motion. They are so anxious to be busy on the concentrations that the attenuations miss their attention. Take an example in physical life. A man goes for a walk. For more than half the time taken he is in a state of instability. His steps are but efforts against falling, and while his feet are successively in the air, he is preparing for the next stable position. Mental life is like this. Progress is measured by the ability to move from one stable position to another, but the stability is conditioned by the healthiness of one's mental preparation.

There is still another aspect which is neglected educationally, and that is the student's continuity in space. We said at the commencement of this article, that space was the stuff left over from the construction of a universe. It is not just shavings or filings, but actual material, and there is a most potent relationship between the various universes and this residue. Radiation is just one of these connections. In education we have been regarding the individual student as separate and distinct, a law unto himself, an absolute entity, a concentration apart from any series. In fact he is continuous with the rest of the universe, a mere knot in the string of happenings, and the vibrations from Betelge reach him and are transmitted by him. While we are fussing over him like a hen over the ducklings she has hatched, he is taking to another element, and is seeking his provender in its depths.

In conclusion, we would say that we did not mean to be critical. The article just ran that way. We do feel, and that deeply, that education is neglecting the association with life, and by life we do not mean merely the life of the job, but life in its fullest and richest signification. A subject is not just a subject, but leads by endless ramifications through Time and Space to the metaphysic of First Causes. We should be allowed to follow some of these strings, to form some associations with other subjects, to extend the pupil till he is humble with wonder and subdued with interest, till he looks beyond June to the tremendous possibilities of the Time-Event, till his tremulous preparations for Storm and Tempest make him a rare and desirable denizen of the universe.

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Manual Training in the Edmonton Public Schools

T. E. HUGHES, F. Coll. H.
Supervisor Edmonton City Schools

IN view of the reawakened interest in the crafts' side of educational effort it was thought that a brief article on the work in Edmonton would be opportune.

In 1911, the course was confined to woodwork only and all pupils in both public and high schools from Grades VI to XI were compelled to follow a plan which gave a very limited opportunity. In many cases, the students did not like their jobs and it was very difficult to maintain any interest, especially in the final years, for the lads were tired of benchwork.

To attempt to meet this situation, experimental exercises in toymaking were introduced into Grades VII and VIII and these "caught on" so well that in 1913 nearly 2,000 toys were made, half of which were for charitable purposes. The bulk of these were constructed from scraps, old boxes—from any waste material the boys could find. When nicely painted and finished these articles compared very favorably with those for sale in the stores. On one occasion a class of girls did the painting and if any teacher or leader of a group of girls is looking for an interesting and enjoyable task, this can be highly recommended, for one could not find a happier bunch than this. From all that can be learned Edmonton pioneered in this as it has done in other changes in the courses of study, and in 1913 other experiments were carried out by the Manual Training instructors to see if it would be possible to introduce other types of handwork.

The suggested exercises in concrete products, leather work, house painting, electrical work, refinishing and renovating old floors by staining and graining, and some elementary plumbing work were attempted, but as there was no appropriation for this effort at the time and the expense was too much to expect the staff to bear, it was discontinued until such time as the Board saw fit to authorize the necessary funds.

The staff who did so much good service in this phase of the work deserve much commendation, for from their findings has grown a course in diversified handwork for the public school grades that is second to none in the Dominion.

Recommendations were made to the Superintendent, Dr. Carpenter, now of the Calgary Institute of Technology, that a try-out be given to part or the whole of our suggestions, and after some discussion a scheme was presented to the School Board who voted the money to put it into operation.

Grade VII were given a series of problems in Drawing—6 weeks; Woodwork (including toymaking)—10 weeks; Leatherwork—6 weeks; and House Painting, Staining and Graining, Glazing, etc.—6 weeks.

Grade VIII had a course consisting of Drawing—6 weeks; Woodwork—10 weeks; Concrete Work—

6 weeks; and Elementary Electrical Work—6 weeks.

Each class spends one-half day per week and although this seems an ambitious programme of work yet the results have been very remarkable.

There were many difficulties to be surmounted, but they only added zest to the task, and not the least of these was the attitude of a certain section of our pupils who rebelled at what they called "Day labor," when it came to the work in concrete. This was met by a quiet but firm insistence that the prescribed projects must be done, and as soon as the boys saw what could be accomplished without terrible strain they became enthusiastic, and now it is a very popular subject.

Another drawback at that time was the complete lack of any text suitable for school purposes. Here the Canada Cement Company came to our aid and they have rendered such service that no small part of our success, it is true to say, was due to their courtesy and support. They furnished data on their own engineers' experiments, invited the staff to attend the conferences held between contractors and the company when matters concerning the mixing and tempering of concrete were under discussion, and encouraged the boys by giving special prizes of \$20 annually for the best work. From the facts supplied by this company, our pupils became really interested in testing sand and cement, carefully measuring the water content and working scientifically. The list of projects contains articles for gardens—bird-baths, seats, pedestals, flowerpots, sundials, etc.; practical problems around the home—windowsills, slabs for paving, etc.; drinking troughs for poultry, weights for anchoring boats, stands for flags, Christmas trees, lamp posts, and other such articles are among the miscellaneous products of the shops.

The boys make their forms in the woodwork rooms and so gain an elementary knowledge of pattern-making; they also have driven home the lessons of careful observation, accuracy, and strict obedience to the instructions given.

Unfortunately, Grade VII has not yet been restored to the privilege of attending the Manual Training centres, but it is to be hoped that the ban—part of the post war economy—will soon be lifted and those boys and girls be able to participate in the activities which attract them so much.

The woodwork course is chiefly cabinet work; first a few preliminary projects in joinery, surfacing, etc., and then a simple box problem, followed by a more ambitious effort in the form of taborets, tables, lampstands, medicine cabinets—anything that the boy requires that is within his capacity to finish.

The electrical work is now confined to such exercises that do not contravene the code of By-laws of the Electrical Workers. The boys learn how to repair household appliances, to put in a fuse, re-

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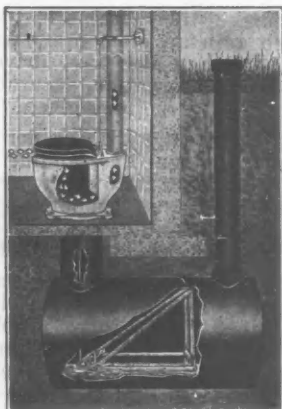
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pair switches, and understand, generally, the theory of housewiring. Their main lessons are on bell-wiring and it is found that quite a large amount of information can be given in these problems. They also get a little automobile-wiring and some teaching about the construction and care of a storage battery.

This, in brief, is what has been tried in this city. It is by no means perfect, but it is a very sincere attempt to give the pupils who are mechanically minded a chance to express themselves. The war caught us in a time of expansion and growth and like so many other endeavors at that time, shrivelled our tender plant. The staff was cut down, Grade VII eliminated for the time being and every

opportunity to economize was taken advantage of. The time has now arrived to press the claims of these boys who ought to be getting some handicraft training before the final year in public school. Other cities and other lands are expanding these facilities, knowing that the countries having numbers of skilled workers are likely to be the most prosperous in peace as in war. It would be most interesting to quote some of the facts given by the Government of Alberta regarding the changing aspect of our economical system, showing how rapidly this Province is changing from one whose basic industry is agriculture, to one in which manufacturing is fundamental; but the length of this article forbids.

Thoughts on Secondary Education

By D. L. SHORTLIFFE, M.A.
Edmonton

IN the course of the rapid changes which have taken place in society during the last quarter of a century the high school has been caught in an extremely anomalous position.

The reasons are not far to seek. A generation ago the high school existed mainly for one purpose, viz., to prepare the student for entry to various specialized callings, such as law, medicine, etc., which required the candidate to have a certain minimum background of academic knowledge. The number of such aspirants was relatively small and they were usually the brightest and most ambitious in the community. That the high school of that day fulfilled its narrow function efficiently will be attested by anyone whose memory runs back twenty-five years.

Then came the great rush. Sudden accumulation of wealth, with the accompanying tendency to lengthen the period of dependence of the child on his parents, brought on a mad scramble for secondary education. This, of course, from the social standpoint, is a good thing; or rather it would be a good thing if our educationists were to make any effective attempt to meet it. As we shall see presently, no such attempt has been made. Hence the futility of our present gestures at secondary education.

It seems to me that any item of knowledge may be regarded from two points of view, viz., that of the race and that of the individual.

From the standpoint of the race it is doubtful if there is a single item of information in the whole universe that would be considered completely useless by a thoughtful person. It is said that the inventor of quaternions boasted that at last a system of symbols had been devised which would never be "degraded" to any practical use. Any tyro in the field of the physical sciences today knows how futile was such a boast. It is similar in other departments of knowledge—the apparently useless items turn out in most unsuspected ways to be veritable slaves in the service of mankind.

From the standpoint of most individuals, nearly all this knowledge is purely "academic"—worse than useless. I say "worse than useless" because

if the individual crams too much of it into his head he loses interest in the immediate tasks of life and thus becomes unfitted to play his part as an individual. "Practical" knowledge immediately applicable to his vocation in life and to his duties as a citizen should form the bulk of his information. Of course it is not necessary to point out that the same portion of human knowledge which is intensely "practical" to one individual will have a purely "academic" meaning to another. There is but one system of human knowledge and the part of it which lies within the consciousness of one individual is a drop in the great ocean of truth. If he is a bright individual he may be trusted to pick up enough useless information on his own account to satisfy his needs, or perhaps even enough to be considered "educated"! If he is not bright there is no use in trying to feed too much information to him anyhow.

It would be difficult to decide which of the above two points of view is the more important in the ebb and flow of human history. It is the old question again as to whether the hen or the egg came first. Changing the metaphor, the chariot of human progress will stop if the individual is not properly prepared to play his part, but without that accumulation of general knowledge above referred to, mankind will have no chariot in which to travel. Both standpoints are indispensable.

It might be argued, of course, that the general knowledge is merely the sum of the different bits of knowledge held by all the individuals and that, therefore, there is no *raison d'être* for a scholar class, a class whose mission it is to pursue knowledge for its own sake. The case, however, is not so simple as that, as any person with any acquaintance with the history of human achievement knows full well. Some of those very successes in science, for example, which have contributed most to human welfare have been achieved by men whose one and only thought was science for its own sake—pure science. The same thing applies to other portions of the field of knowledge.

Whatever might be said as to the relative values of these two points of view from the standpoint of the general current of human history, there can be little divergence of opinion, it seems to me, when we

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That the very existence of civilization depends on the husbanding and cultivation of that vast store of racial knowledge handed down from the past, no thoughtful man will deny. It is apparent, therefore, that a class of people commonly called "scholars" is absolutely indispensable if there is to be any conscious continuity to human history.

Nevertheless the greater part of this vast accumulation of knowledge is completely useless and of merely academic interest from the standpoint of the average individual. Nor is there any harm in this. The great bulk of the daily round of the world's work must be done either physically or mentally by people who are too busy to contemplate the "glories of human knowledge" very frequently, and who, it must be confessed, would not so contemplate anyhow. Their leisure time, quite properly, will be spent in recreation and amusement, and any proper system of education will take this important fact into account.

It is true that two or three occupations, such as surgery, selling a few drugs and a great deal of cosmetics, prosecuting or defending in court, etc., have arrogated to themselves the title of "learned professions," and have insisted on their members acquiring a certain "background" of academic knowledge having no direct bearing on the activities of their professions. I am not in a position to pass an off-hand opinion as to the legitimacy of all this, but I have my doubts about it.

It becomes apparent from the above discussion that for the purposes of institutional education knowledge should be approached almost exclusively from the practical, vocational, and individual point of view.

With the sudden increase in high school attendance to which reference has been made the educationists were confronted with a real problem. That problem was the creation of a system of secondary education to meet the needs of this ever swelling army of young people without injuring the prospects of that small class who still require something in the nature of the old, academic type of high school training.

That this problem has occasioned tornadoes of talk and little or no action will hardly be denied by anybody. On the contrary the old academic curriculum, with its content increased, is being administered to almost the entire student body. At any rate this is what we say we are attempting to do. I admit there is small likelihood of our actually doing it. Such a process is bound to be more or less farcical.

In other words our reply to the challenge has been about as follows: "Come to high school, young people. We believe in high school education for every boy and girl in the community. True, the material we shall teach you will be completely useless to most of you. But come! We shall teach it to you anyhow, even if we make incurable bluffers out of you in the process. Our duty in this new day is to train you for citizenship and we propose to perform that duty by administering to you exactly the same training as was given to an entirely different class for an entirely different purpose a generation ago. At any rate this is what we shall pretend to do."

This attitude on our part constitutes the impasse in our high school system.

There is not enough space permitted in an article like this to describe in detail what I think should be the system of secondary education in the immediate future. Certainly the old scholastic type of training should not be neglected, but its incidence should be felt by a very small section of the student body. "Odds and ends" of such training, of course, would have to find a place in the training of other students, but only as "odds and ends." I consider that for the great mass of students such activities as athletics, debating, drama, etc., in addition to definite vocational guidance and training, should constitute the curriculum instead of being, as now, "extra-curricular."

This, by the way, would be the acid test of the sincerity of those who of late have been claiming such great virtue for these activities. My quarrel with these people is not that I think they are wrong. I think they are right! But I accuse them of that lack of faith which paralyzes action. They are not prepared to act upon their own philosophy!

It is conceivable that in future we shall have, among other curricula, one containing emasculated academic courses for that increasing class who are not concerned either with any particular calling or with any serious scholastic learning. I would vote for that. In such a curriculum, easiness of task with no set standard either for entrance or for graduation would be the watchwords. The element of bluff would be eliminated—an incalculable gain in any system of training for citizenship.

In closing, I might say that I anticipate many criticisms of this article. Among these will be the following: "You are dealing merely with the imparting of knowledge. Education is not that process at all. Rather is it the *development* or the *leading out* of the *faculties* of the *soul*." May I reply in brief by saying that it is precisely my experience that has led me to be a little wary of these soul developers? That the "soul" or mental quality of a child develops, few will deny. But that it develops any more quickly by conjugating Latin verbs than by practice at stock-judging remains to be proved. Incalculable damage has been done in the past by these busy-bodies who claim a degree of wisdom that would justify them in an attempt to remake the mental faculties of a child by teaching it a bit of history or algebra. I plead that we have no such knowledge and that any efforts based on the assumption that we have such knowledge are bound to be downright quackery with its attendant evils.

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A Great Schoolmaster

W. EVERARD EDMONDS, M.A.
Strathcona High School, Edmonton

IN the month of June, eight years ago, there passed away a man for whom I have always had a boundless admiration. This was Dr. Parkin, whose addresses on education always made me feel proud that I belonged to the teaching profession. As an organizer of the Imperial Federation League, as Principal of Upper Canada College, Toronto, and as administrator of the Rhodes Scholarships Trust, Dr. Parkin performed a number of important services for Canada and the British Empire, but he will be best remembered by many who came under the spell of his influence as a great teacher and inspirer of youth.

George Parkin was born on a bush farm in New Brunswick in 1846, the youngest of a family of thirteen children. From the common school at Salisbury, he went to the Normal school at St. John where, at the age of 17, he gained his certificate as a teacher. He taught for two years, after which he attended the University of New Brunswick, graduating therefrom in the year of Canadian confederation.

For more than twenty years, from 1867 to 1889, save for one year at Oxford, Parkin was engaged in teaching at Bathurst or at Fredericton.

While in England, Parkin had the good fortune to meet Edward Thring, the famous headmaster of Uppingham. Thring was an old Etonian, and a graduate of Cambridge, but he immediately recognized in the son of the New Brunswick bush-farmer a true spiritual kinsman. Both were born teachers, and an invitation to visit Uppingham was quickly given and quickly accepted.

Parkin has received this tribute from Bliss Carman, who, for a time, came under the influence of his magnetic personality: "I cannot conceive of a teacher with greater power to arouse and inspire his pupils than Dr. Parkin had—a power he possessed in such abundance and spent so lavishly. The secret of his power, of course, was the heart of the man, his consuming enthusiasm for the great cause, the cause of human goodness and advancement everywhere. In this cause he was a mighty soldier. It was this absolutely unequivocal devotion to the finest ideals, this unquestioning devotion to duty, which was the driving force behind that keen unrelenting mind and that tireless physique."

In 1877 Parkin attempted to establish a residential school for boys in St. John but his experiment ended in failure through lack of funds. In 1878 he married into an old Loyalist family, and ten years

later he went to England to collect material for an authoritative "Life" of Thring. While there he received an offer to visit New Zealand and Australia as an organizer for the Imperial Federation League, and the year 1889 was spent chiefly in the antipodes.

From 1889 to 1895 he lived in England, giving innumerable lectures, and writing almost continuously for the press. He wrote a book on "Imperial Federation" and another entitled "Round the Empire." In 1892 he wrote a series of letters on Canada for the *Times*. This series, which appeared later in book form under the title of "The Great Dominion," was a complete answer to Goldwin Smith's "Canada and the Canadian Question." In 1903 his "Life of Sir John Macdonald" was added to the Makers of Canada series, but his reputation as a writer rests chiefly on his "Life and Letters of Edward Thring," which was published two years after his appointment to the principalship of Upper Canada College.

Founded in 1829 by Sir John Colborne, Upper Canada College is recognized as one of the historic schools of Canada. When Dr. Parkin took charge it had fallen on evil days, and its future was dark and uncertain. He at once set to work to improve the tone of the school, and met with a fair share of success, though it was well that after seven years of strain a wider field of work was opened up for him in the administration of the Rhodes Trust.

It was no light task which Dr. Parkin undertook as organizer of the scholarship system, but that the foundations have been well and truly laid is no longer a matter for doubt. Though the first generation of Rhodes scholars is still young, and though dogmatism would be premature, statistics compiled since Dr. Parkin's death go far to show that he builded better than he knew. Many of the early scholars are becoming men of distinction, and all realize their debt to the first administrator.

On New Year's Day, 1920, Dr. Parkin was made Knight Commander of the Order of St. Michael and St. George, and later in the year he resigned his secretaryship of the Rhodes Trust. He lived on for two years longer, and then in June, 1922, set out for that bourne from which no traveler returns. He never sat in parliament, nor ever held office under the Crown, but his inspired devotion fed the spirit of an empire, and gave life and energy to the forces which make for imperial and international friendship.

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On Exchange in Edmonton

MISS HELEN M. RENNIE, Exchange Teacher
from Aberdeen, Scotland.

AS an Exchange Teacher, speaking to colleagues, I propose to confine myself to what has especially struck me as being different, more especially in school life. I emphasize that word "different," for I consider if this exchange system is to benefit a teacher professionally, those differences have first to be realized, then selected and adapted.

My first impression was of your wonderful sunshine, the intense blue skies, and the exhilarating effect of the pure air. I have turned my back on one of my very constant friends since coming to Canada—my chubby umbrella—for only on one occasion have I ever allowed my old friend to accompany me, and that was during a thunder storm in Toronto.

Edmonton was so different from what I had visualized. Its size amazed me. In fact, for the first few days, I was never sure if I were still in Edmonton, or had arrived at another town. Indeed, I was properly hoaxed at Christmas, on setting out by the C.N.R. morning train to Stettler. After a considerable journey—up hill and down dale, and even across rivers, we arrived at a station, which, judging by the number of passengers, seemed to be no one-horse town. You can imagine how I felt on learning that this was the South Side.

Edmonton did not look at all like the "woolly west." Where were the Indians and the cowboys with all their flash and color? Edmonton was much too civilized.

The superintendent gave me a hearty welcome, but I felt rather disappointed when he told me I had been assigned to a school in the East end. I immediately pictured some old building, encompassed by others equally old, and where real fresh air might seldom penetrate. You can imagine my pleasant surprise, then, on seeing Parkdale. But my surprise did not end there, for from the first, everything and everybody has contributed to make a happy time for me. After all, happiness at work is a very big factor with an exchange.

What greatly strikes one from the Old Country is the enthusiasm for education. Not only are the buildings well built and well equipped, whether schools or colleges, but there is a wide-spread interest in the subject. I had imagined that the schools would be more of the bungalow type, with probably eight rooms at the most, so I was much impressed by the size and solidity of the school buildings, and on entering them was further delighted with the size and equipment of the classrooms.

Almost everything was different, for I had been accustomed to sloped floors; dual and triple desks; glass partitions between the rooms; smaller rooms and more pupils. Classes at home generally run from 45 to 55, but are always of one grade in the city schools.

Schools in Aberdeen are of three kinds: Primary, Secondary and Intermediate.

The object of the Primary School Curriculum for children up to 12 years, is to lay the foundation on

which the superstructure shall be erected. Each child presented—average, below, and above average—is tested in writing on such subjects as Arithmetic, Mental Arithmetic, Composition, Grammar and Language, Diction and Spelling. This is known as the "Control Examination." The child has spent seven years in school—two in the Infant Department; two in Junior, and three in Senior. He may have had only three different teachers during these seven years, for to save time in getting acquainted with new pupils, etc., we, in Aberdeen, of late years have generally gone forward with our classes. That is to say, a teacher of infants, would accompany the children through that department for two years. At the end of that time, phonetics will be fairly well mastered, and each child is supposed to be able to add to 20 and apply this to small sums. They have been taught to form and join small letters, to spell orally, and have taken singing, musical games, memory work and handwork of various kinds.

The second teacher then enters on a three years' course—two for Junior work and the third for starting Senior work. At the end of that time, the pupil professes: Addition and Subtraction of larger and more varied plain and money sums; Long Multiplication and Long Division of numbers and money; Reading and Spelling; Oral and Written Composition, along simple lines; Analysis of simple sentences; parsing in detail of nouns and verbs; detailed Geography of Scotland and stories of Scottish History. Two hours per week is given to Religious Instruction in every class in school; one and one-half hours per week to Art; one hour to Physical Instruction, and one hour to music.

Two further years in the Senior Department and the average pupil passes this "Control Examination" and goes either to a Secondary School, from which he can gain admittance to a University, on completing five or six years course, or to an Intermediate School.

We have remaining a mass of children of varying abilities and aptitudes who have all reached a minimum standard in the subjects of the Primary School Curriculum. They come from homes of every type, and their future course is largely determined by the economic conditions of their homes. The majority will leave school at fourteen years of age and cast themselves on an overcrowded industrial market. For these we have opened in Aberdeen, Intermediate schools, when along with a continuation of these basic subjects, the majority of the pupils follow courses where practical instruction is given more time and attention. Domestic science, woodwork, science, commercial training, and organized games all have their places on such a curriculum.

Teaching in Canada, one notices at once the different arrangement of the Primary schools into eight grades; the school age, six to sixteen, and consequently the fact that the children are always older than at home.

Coming to actual teaching in Edmonton, one is faced with new subjects, as in the Junior Curriculum: Citizenship, Health Talks, and Nature Study. I cannot mention that Curriculum without commenting on the fact of its being made out for each month's work. That surely is a great boon to local teachers, for how many hours the Old Country teachers have to spend in mapping out their work from the merest skeletons supplied with the year's outline.

The grades here seem more or less on parallel lines, while at home one class is always three or six months ahead of the other, so that if a pupil from illness or other causes fails to make his grade, he is not asked to repeat a year's work, but only part.

Some people have asked me whether or not I find the pupils here more advanced. That is a difficult question to answer, for in different subjects they seem to be at different stages. For instance, teaching a Scottish class, it is often difficult to get these young people to express themselves fluently, as many have the difficulty of the two languages, and find trouble in translating their familiar Scotch into fluent English. Not so here, with the Oral Composition lesson. Instead of being difficult to get them started, the difficulty is to stop them. A vast amount of Phonic Drill must be covered here in Grade I, for the children of seven certainly seem to have mastered the initial difficulties of reading. The number work of Grade II corresponds with that of our Senior infants.

In the Primary schools at home, our aim is to secure form, and form alone. No attempt is made at speed in a writing lesson proper, and I must say that even with very young children something very legible, clear and beautiful is produced. The great aim of this arm movement seems to me to be speed. But why have this great speed with writing? The only application as far as I can see is the taking of notes—and then, are they written? We in the Primary schools give very few notes.

Coming to the actual pupils, I find them mostly a healthy bunch of youngsters, full of animal spirits, but easily disciplined. They like to work hard, and to play hard. At first I was greatly amused by the outfit of my small boys of seven. They looked so like men in miniature. I also envied these boys when in the winter they arrived at school with their skates slung over their shoulder in anticipation of rushing off to the rink at four o'clock. These rinks were an entirely new idea to me, for I had imagined that Canadians were all the time on skates in winter. I had even pictured myself skating all the way out to Parkdale.

I find the children full of fun and venture, being at times quite versatile. One day we were preparing to dramatize "Noah and his Ark," and I had just got each fixed up with a part, when the bell rang for dismissal. One bright lad stepped out of his line and very beseechingly said, "Please, Miss Rennie, I would rather be God than the elephant."

At first I was rather overwhelmed to find that in my class of forty-one I had thirteen nationalities represented. This is indeed one of the big problems of school teaching in Western Canada. After getting acquainted with them, I find that they weld together well. The only one I seem to pick out as a foreigner, or I should say, a "New Canadian," is a little Hebrew

boy, but then you must remember I am an Aberdonian, and that will explain it.

Some of these New Canadians, I find, are really very clever children. At Christmas I had one girl of seven who sang us a little song in German and then the same song in English. I considered that quite an accomplishment, and felt that instead of encouraging her to forget her own language, something should be done to advance both concurrently, so that later, she would not require to relearn her own language. I'm sure that an adult linguist so gifted would have no difficulty in obtaining a very high-salaried post in the Old Country at any of the fishing posts where so many firms must have competent secretaries to handle their correspondence from the European posts.

I also find quite a number of these children specially gifted in Art, and these are indeed my saving grace very often in carrying out your rather elaborate Art scheme.

I have learned little very new in the way of excuses. Birthdays here seem to be celebrated amongst the children in much the same way—by "ducking," but no Scotty has so far brought me the same note from Mother as this Canadian: "Please excuse Tommy being absent yesterday as it was his birthday, and the boys promised to beat him up."

One of my seven-year-olds got rather mixed up in her relationships. She was the youngest member of a big family, and the proud possessor of a niece who had recently come to Edmonton. The pair of them arrived one morning about half-an-hour late, when Helen introduced me to her little relative, "Please Miss Rennie, we can't find her school. She's an R.C. She's my little auntie."

It was new to me and very interesting to find the children celebrating with such delight Hallowe'en and St. Valentine's Day.

It has been my great privilege to meet many of the teachers of Edmonton. My first impression was "How young they all are!" Now I don't seem to notice this so much. Why? No! It is not that I have been disillusioned, but rather that in meeting you I have caught something of your eager and buoyant optimism, and I have grown younger.

Here one meets a teacher of twenty-two say, with five years teaching experience behind her. At home, our teacher of twenty-two is a few months from college, and only if she has the best of luck has she received a teaching post of any kind. Our girls, after completing their six years course at a Secondary school, have had a further two years training at a Training College, or should they have graduated, they have been three years at the University and one year at a Training College. After starting teaching, many take advantage of the summer schools, or any short course put on during the winter.

The grading of teachers and their consequent continued study either for Grade XII or for University, has greatly impressed me. We have many women Graduates—especially among our younger teachers—in Primary schools, and their longer training is rightly well recognized in the salary schedule. We, in Scotland, have a National Minimum Scale to which most authorities have very generously added.

Under the Superannuation Scheme, for teachers, in Scotland, for 1926, the retiring teachers are pro-

vided with an allowance made up of two portions: (1) a pension; and (2) a lump sum.

The Pension is calculated on the average amount of the teacher's salary for the last five years of service. It is 1/80 of that average for each year's service up to 40 years. Though you teach longer, 40/80 is the maximum given.

Take the ordinary healthy person with £300 each year for the last five years. That is her average. If she has taught 30 years, her pension would be 30/80 of £300 per year. Forty years would be 40/80 of £300, and that is the maximum—£150 or \$750.00 per year. The lump sum is 1/30 of the average of the last five years' salary for each completed year of service, but this time it goes up to a maximum of 45/30, i.e., take the average, £300.

Teaching 30 years, lump sum would be 30/30 of £300—£300
 " 40 " " " " 40/30 of £300—£400
 " 45 " " " " 45/30 of £300—£450

The second of these, 40 years, is the most common, the teacher receiving therefore a lump sum of \$2,000.00 and an annual pension of \$750.00.

The contributions towards benefits under Superannuation Scheme come under two heads:

(1) Each year an amount to be paid by the teacher equal to 5% of his salary.

(2) An amount to be paid each year by the Education authorities by whom the teacher is employed, equal to 5% of the teacher's salary.

Only the other day I was asked if I in any way regretted coming to Canada, and my answer was a most emphatic "No!" I was further asked wherein our exchange system could be improved. Perhaps you will permit me to suggest one point: the exchange teachers visiting the Old Country have great facilities provided for visiting places of interest, thus having an excellent opportunity to become better acquainted with the great background of history and literature. Very frequently, through the generosity of the local school authorities "time off" is granted these exchange teachers. Coming to Canada with its vast distances, we find that we have more or less to stay in one town during the whole year. Any research work done here must then be done on the spot. Might I suggest, then, that future exchange teachers through your country, be given facilities to either visit places of interest in and around Edmonton, or to observe any school work being carried on on special lines.

PERFECTED KNOWLEDGE

"When I grow up I expect to be a teacher. A teacher hasn't much to do and besides gets good wages and only has a few hours to work. They have two months holidays and they don't get their hands soiled or cracked.

"I will fit myself for this by going to high school and University. I will teach outside of the city. Then I will teach inside the city. I will then teach 'till I have enough to last me the rest of my days."

C. L. GIBBS EXPRESSES APPRECIATION

C. L. Gibbs deeply appreciates the splendid support given by the teachers to his candidature in the recent election, and takes this opportunity of thanking one and all for their votes and influence.



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TORONTO 2

Mathematics and Education

PROFESSOR ALEXANDER J. COOK
The University of Alberta, Edmonton

(The substance of an address, given at the spring, 1930, meeting of the Alberta Educational Association, at Calgary, Alberta)

1. MATHEMATICS AND "THIS CHANGING WORLD"

THE uninitiated are prone to think of mathematics in somewhat the same terms as the so-called "dead" languages. For them mathematics is a study designed in some manner by the ancients for the purposes of sharpening the wits, disciplining the will, and teaching people to reason properly. Indeed it is true that most of secondary school mathematics is classical in content and in spirit, so much so that there is little realization in the mind of the learner of the growth and significance of mathematics beyond the classical period.

The history of mathematics as creative effort in our western civilization begins with the thirteenth century. Prior to that time, with the collapse of the Roman Empire the centre of scientific interest shifts for some centuries to what we call the Near East where the treasures of Greek science were preserved and studied, and where the earlier Hindu influences had their effect. With the decline of Arab power the hazardous work of translation into the language of Europe was begun, but it was not until 1200 A.D. that the mathematics of the older civilizations could be said to be in the hands of the European scholars.

From now on the story is the rise of the West, that thrilling drama, strident and cruel, yet withal a pageant of the human spirit always rich with adventurous achievement. The mathematical creation of this time will remain with the race long after its visible monuments have perished. From 1200 A.D. on, there is a rising tide of creative energy reaching one climax in the days of Descartes and Newton, yet continuing beyond their day in an unabated flood throughout the western world to our own time.

As to the results of this movement during any period no one country can claim the honor; from Russia to Switzerland all share in the glory of it. Those who scoff at the spirit of international co-operation as a day dream, forget that it has been in the west as a reality for centuries.

Now creative activity of whatever sort has sooner or later a tremendous significance for the human race. For example, witness today how the radio and the phonograph (ugly word) are revealing the beauties of great music hitherto the treasure of the few, now the possession of all who have ears to hear. We may note also that the increasing beauty of this revelation is being made possible by the utilization of ideas, such as the emission of electrons from hot bodies, which originated in the realms of the purest of pure science. In the same way the energy that was poured into the creation of the magnificent and innumerable mathematical theories of the last three centuries was not wasted energy. Thus, to cite only one example, the prodigious upheaval in our ideas and in our own living, still in progress, because of so-called evolutionary concep-

tions was not the work of one man, nor the product of an isolated marvel of scientific thought. Some of the seeds of the success of the movement are to be found in the work of Descartes and Newton and their contemporaries. The mathematical theories of change were well matured and well known before Lamarck, Darwin and Wallace began their epochal studies. Indeed it was not long before the biologists realized this, for, as in many other fields of scientific research, the mathematical concepts they needed for their quantitative thinking were waiting for them at their elbows.

2. THE SPIRIT OF REFORM

Once the significance of mathematical thought in relation to scientific and technical development began to be grasped, it was not long before voices were raised insisting on change in the programme and spirit of mathematics in the school. There was, for instance, the voice of the practical man, the man who has to deal with what he likes to call the real things of life. He finds it difficult to see why we can't get on with the job, and get the lads trained for the work of life without all the weary insistence on Proposition XXIII, Book IV, and the like. His is "the impatience of a parson," and we shall always need his voice, however extreme we may think him.

The voice of John Perry of the Royal College of Science at London, was such a one. In his address to the British Association for the Advancement of Science, meeting in Glasgow in 1901, he put forth his ideas in trenchant form. His ideas were workable for him since he had tried them out for a quarter of a century prior to that time. Listen to him.*

"I have the belief that the study of physical science, and therefore the study of mathematics, by everybody, however poor or however rich, is of the utmost importance to our country, not merely for the knowledge it gives, but for producing the scientific habit of thought. . . .

"A man in the twentieth century whose eyes are not educated through the principles of natural science, can take no proper lessons from history or literature.

"I feel sure that our system of teaching boys (we may add, girls) elementary mathematics as if they were all going to be pure mathematicians must be altered.

"Now we teach all boys what is called mathematical philosophy, that we may catch in our net the one demigod, the one pure mathematician and we do our best to ruin all the others. It is nature's way with fishes; ten thousand herrings spawned for one survivor . . . ; ten thousand Toms, Dicks and Harrys mentally destroyed for the sake of producing one man fit to be a mathematical master of a . . . public school. . . . But I would like to point out that ours is an altogether foolish way of producing the mathematical master also."

(See Section 6 of this paper).

"Perhaps the worst fault of our teaching is that the pupil is taught as if he were going to be a teacher himself."

*Perry, J. *The teaching of mathematics*. Educational Review (1902) pp. 158-181.

"The present method of training the mind . . . causes it to strain at gnats and to swallow camels. . . . The camels I do not care to mention because I am in favor of their being swallowed, and indeed I should like to see them greatly increased in number; they exist in the simplest arithmetic, and geometry and algebra. Why not put aside ever so much more, so as to let a young boy get quickly to the solution of partial differential equations and other useful parts of mathematics that only a few men ever reach?"

"In these days all men ought to study natural science. Such study is practically impossible without a knowledge of higher mathematical methods than that of the . . . housekeeper. As examples of methods necessary even in the most elementary study of nature I may mention the use of logarithms in computation; knowledge and power to manipulate algebraic formulae; the use of squared paper; the methods of the calculus. Dexterity in all these is easily learned by young boys."

Well, Perry's influence has been profound and mathematical teaching is the better for him. Pick up a good text book; read the reports of the Associations; you cannot but be impressed with the change in the directions indicated above that has come and is coming over mathematical instruction.

But the mathematicians themselves have not been idle, for the tremendous development of mathematical research which I have tried to indicate has crystallized conceptions of vital concern for the school. In France, Germany, Great Britain and United States the outstanding mathematicians are among the outstanding educational reformers. Men like Borel and Tannery in France; Klein in Germany; Bromwich, Hardy, Nunn, Russell and Whitehead in Britain; Moore, Osgood, Slaught, Smith and the Youngs in United States, have all made contributions to the progress of the teaching of mathematics. These men know what it means to create, and creative activity is the soul of true education.

Great as has been the work of individuals, the influence of the various national mathematical associations has been far more profound. Reports like the British report on the teaching of geometry in the schools and the American report on the reorganization of high school mathematics have an authority which textbook makers of today do not dare to resist.

3. THE PLACE OF MATHEMATICS IN THE EDUCATION OF YOUTH

The answer to the question "What place has mathematics in the education of Youth?" depends largely on the meaning ascribed to the terms mathematics and education. Do we conceive of education as a process of creative effort on the part of all those engaged in it, or is our emphasis on the idea that education is in substance a series of institutions, sectional in character, each more or less jealous of the other, each with certain traditions and customs which must at all costs be maintained? Is the root of matters mathematical "a faith once delivered to the saints" in the narrow meaning of that phrase? Does mathematics mean substantially what Whitehead tersely describes as a scheme of "cramming the children with theorems they do not understand and will never use?" Or is there in the mind of the teacher the vision of mathematics as a creative venture of the human spirit, not bound by nationalistic ties, running deep throughout man's recent his-

tory, a highroad of spiritual reality like true religion or great music or any other of the arts?

There can be no dispute in the matter of mathematics as a creative venture; that is a fact of history and experience open to individual verification. Nevertheless the question still remains: Can we justify the study of mathematics as one of the bases of common education?

The answer which appeals mainly to the past is insufficient. The fact that mathematics has persisted in school curricula through the centuries merits consideration, but it is an effect rather than a cause.

Then there are supposed to be features in the way of brain-developers peculiar to mathematics (and in the same breath, people say the classics), which render its presence in any curriculum imperative. Here for example is a prominent business man in United States writing to his son at college.*

"You cannot realize, as I know, what it means to have a training in doing work that is dull, dreary, drudgery. It makes little difference to me whether you later make any use of your calculus or your Latin—to get your passing marks you have to do a certain amount of drudgery in detail—and that is the training of mental muscle which is of the utmost importance when you enter business."

This man is trying to portray to his boy what for him had proved to be a truth of some importance. Yet no teacher of mathematics can accept in tranquility such a medicinal explanation—and it is out of date medicine at that—for his life-labors. If mathematics is largely dull, dreary drudgery then it has no business in our school, at any stage.

What should constitute the bases of common education? We will all probably agree without much dissension as to what these bases are; what we do not sometimes realize is that these elements are "deeply interfused" one with another. These basic elements may be grouped into three classes which I should like you to think of in a horizontal row, rather than in a vertical column. They are:

Language. The Study of Environment. In broad terms designated by the words, <i>History</i> and <i>Science</i> .	"The Testament of Beauty." The arts so called. <i>Art, Literature, Mathematics, Music</i> , etc.
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I stress the horizontal rather than the vertical order to bring home that each of these classes draws extensively upon the other.

It is evident that *Language, History, Science* perforce form part of the active equipment of every child whether he "attend school" or not. The function of the teacher, may I say of every teacher, is to encourage systematic and adequate growth in these branches of human knowledge.

What of mathematics? Can it lay fair claim to being a basic element in common education? I mean, can we justify mathematics as a common study for every pupil until the time when specialization commences? The question, to my mind, admits only one answer, and that an emphatic affirmative. We may state the reasons briefly as follows:

We have stressed thus far the creative aspect of mathematics, partly because it is little understood by the layman, who may well be a teacher in some neighboring field. Mathematics is also a language,

*Saturday Evening Post, p. 41. April 19, 1930.

the language of science, the language with which modern man seeks to interpret his environment. Every Canadian girl and boy should have an understanding of national history, which entails of necessity the ability to use the spoken and the written word. Likewise the understanding of our environment in its broader meanings cannot be had without a knowledge of the spoken and written word—but of a second language as well, universal in its characters, and vastly more important than the first to this understanding—the language called mathematics.

To sum up. Mathematics is a language, with insistence, be it noted, on clarity and precision (a major portion of pupil difficulties in mathematical and language difficulties). Mathematics is basic to science and indeed these two should be harnessed together at every stage for they belong together by nature, and cannot be torn apart without crippling both. Lastly, mathematics is an art, to use Robert Bridges' phrase again, a main chapter in the "Testament of Beauty." These ideas constitute my claim for mathematics as an integral factor in the non-specialized training of the child. The question of specialization will call for comment later.

4. CHANGES IN THE SCHOOLS

We may note at the outset that the situation in Canadian schools reflects little of continental thought; the curriculum is traditional and Canada has made little or no contribution thus far to the discussions that have taken place since the beginning of the century. She hardly seems to have been aware that there were discussions. This is not to be wondered at, perhaps, but one does not anticipate that she will be long content with such a position.

If we confine our attention to the English speaking countries, change is most evident in the junior grades of the high schools. We find remarkable unanimity of opinion in Britain and United States as to the aims, emphases, and content of mathematics in the junior grades.

In England * "The normal minimum curriculum . . . includes arithmetic, algebra, geometry and in almost all cases trigonometry of a simple numerical kind; . . . these are the subjects found in the First Examination Syllabi."

"Arithmetic now includes logarithms (we may note that arithmetic is taught in the early stages, including Grade IX); algebra includes graphs but goes no further than the traditional quadratics and progressions." However, "The truth is probably that it (algebra) needs an outlet such as logarithms provided for the work in arithmetic. Compared with the size of the tool, the pupils have made, as yet, little use of it."

The geometry courses on both sides of the Atlantic have been largely influenced by the excellent report of the British Association. The Euclidean order is being broken down, camels are being swallowed with greater frequency, informal three dimensional thinking is receiving encouragement, as well as the tie-in of the material with trigonometry. Carson says that "the teaching of geometry (in England) has received more attention than the teaching of

the other branches; and . . . there is no lessening of this close study and experiment."

The introduction of numerical trigonometry into Grades IX and X may seem a radical step. Carson says "this subject is not regarded as a luxury for the abler pupils only; on the contrary it is studied by all or nearly all, and has in practice been found to be a solvent whereby many boys and girls have found a first interest in, and power over, their mathematical work."

These trends are paralleled in the developments which are going on in the United States, where the Junior High School movement has been of so much interest and significance.

Indeed it is a healthy movement which seems to characterize the lower grades in these countries. To repeat Carson's phrase, there seems to be no lessening of close study and experiment.

When we come to consider the senior grades the story is somewhat different. In United States the senior school course seems to be static, generally speaking. Experiments are going on in the larger centres. This is not to say that no one has clear notions as to what the senior grades should contain. Again the British and American reports have definite and similar ideas on the subject. The British report on the teaching of mathematics in public and secondary schools issued in 1919 and reprinted in 1928 says in its summary of recommendations, "The mathematical course in the earlier stages should not be concerned exclusively with arithmetic, algebra and geometry; that such subjects as trigonometry, mechanics, and the calculus, should be begun sooner than has been customary and developed through the greater part of the boys' (girls') school career, so as to give him time to assimilate them thoroughly, and enable him to cover more rapidly at a later stage the higher parts of arithmetic, algebra and geometry."

"No boy should leave school entirely ignorant of Applied Mathematics (e.g. Mathematics relating to Machinery, Structures, Motion of Bodies, Astronomy, Electrical Plant, Surveying, Statistics)."

We have seen how these projects have been started by the filtration of trigonometry, so-called, into the earlier grades. The movement downwards of the calculus ideas is also well begun, as the newer texts indicate. These books also attempt to relate the subject matter to its applications in some vital way.

We may remark that the high school situation in England is much to the fore these days, with the promise of the government to bring into active effect the proposal for a higher school-leaving age, now to be 15 years. It has been estimated, for example, that this will require the immediate services of 15,000 more teachers. One can imagine how much is yet to be done there in every field of secondary education, but a promising beginning has been made as far as mathematics is concerned, and the further developments will be of interest and profit to us all here.

5. MATHEMATICS AND THE NEEDS OF THE STUDENT

It is necessary, yet not sufficient, to discuss the changing mathematical curriculum. There are other problems which the teacher of the subject has to

*Carson, G. St. L. (H. M. Inspector of Schools). "Significant changes and trends in the teaching of mathematics in England since 1910." Fourth year book, Nat. Council of Teachers of Math., U.S. (1929).

face, and one of these is so real to all of us, that I wish to touch upon it. The problem concerns more particularly the senior school (XI, XII), where progress is slower, probably for the reason that the roads are not so evident as in the public and junior schools. A quotation from a recent and excellent American text in Plane geometry puts the problem in a sentence.*

"The student is shown just how the theorems apply in problems in navigation, astronomy, surveying, mapping, architecture, designing and art. This list will be particularly valuable to the student who is interested in a general course instead of a purely college preparatory course."

One may remark at this point that a characteristic of present day discussions is what for the want of a better phrase one may call "dilemma thinking." Realist or Idealist, Religion or Science, Vocational or Cultural and so on. Such a dichotomous classification is altogether too primitive.

Here again then we must know what our terms mean. What is "a purely college preparatory course?" Here are two boys; let us make the large assumption that we know in advance that one is fitted to be a mechanic, while the other is fitted to be an engineer. Both are to study geometry, of course. Is it true that the future mechanic should be shown just how the theorems apply to problems of surveying, mapping, etc., while such teaching will not be particularly valuable to the budding engineer? The budding engineer is surely to be presumed to have as keen a vocational interest as the budding mechanic.

The plea for separate courses in basic subjects such as mathematics, has probably received more attention in the past than it justly deserves. We hear of a cultural college preparatory course for students who are to go on, in contrast to a general vocational course for those who are not to go on. As a matter of fact nearly all the entrants to our universities have or are trying to discover for themselves, definite vocational ends. The bogey of a "purely college preparatory course" has been set up, warning off the many from the verdant pastures of social excellence. It is time the teaching profession united for its destruction. Let mathematics be taught at any stage for that stage, as if the particular year were to be the student's last year in the study, no matter the calibre or the age of the student. The treatment of relative brilliance in pupils is a matter on which there is no united voice. Nevertheless we cannot go on ruining the majority for the sake of the demigod. We should note, however, that leaders in mathematical education the world over have repeatedly stressed that the spirit just indicated for the teaching of the subject is eminently suited to the future specialist also. We may, for instance, recall Perry's remarks in this connection. The same point was made by Professor Frank Morley of Johns Hopkins University in his Presidential address to the American Mathematical Society in 1921. "The attempt to introduce any branch of mathematics as a pure self-contained logical science is bound to disappoint," says Professor Morley. "I do not, of course, mean this to apply to non-elementary teaching. It is proper to separate the sheep from the goats, but I believe it is a mistake to separate the lambs from the kids." We may also quote a letter from Professor Osgood of Harvard University,

written in 1923, and dealing with the problems of freshman instruction. Professor Osgood writes with regard to the purposes of the freshman course in mathematics at Harvard: "We believe that there is no clash between the interests of students who are going on with physics or even pure mathematics and those whose study of mathematics will end with the freshman year."

Given a mathematical curriculum permeated with the modern spirit there are good and to my mind sufficient reasons why every child should study mathematics without election until the end of, say, Grade X. It is further suggested that Grade XI might well be the beginning of a genuine specialization on the part of the student, but the pupil who elects mathematics in any year after the Grade X stage, should elect *mathematics* and not a fragment of the study, as he may do at present. Certainly, as the British report previously quoted says, "The boy who takes mathematics as his main subject in the later part of his school life should also, in general, study science, as well as carry on some form of literary study." So also the boy whose main subject is non-scientific in character should carry on some form of scientific activity. But this activity should be coherent. If it is mathematical, let it reveal to the pupil at the given stage the big ideas which dominate the subject at that stage, in Whitehead's words "the really important topics," the "few general ideas of far reaching importance," where the pupil may gain "familiarity with conceptions that really influence thought."

6. CONCLUSION

What reference has the preceding to the situation in Alberta? I have been trying to present the case for mathematics as a living and a growing thing, whose importance in the training of youth has somehow been dimly grasped for generations, but which is now becoming more clearly realized by thinkers in every country. New curricula and new attitudes for all our educational institutions, the world over, are coming into being. No subject may remain in the curriculum by force; the curriculum must be conceived in a co-operative and not in a competitive spirit.

In Alberta the shoe pinches at present in Grade XII. Grade XII mathematics as constituted is admittedly not suited for the non-specialist. What seems harder to understand is that for the specialist the course can also be tremendously improved. The world has moved on since the course was first designed a generation ago and the standards of design then in vogue have been largely superseded. I have tried to indicate the reasons for this, suggesting the vast amount of thinking that has been done on these matters before and since 1905. No amount of tinkering with details will suffice. We must build on principles and sanctions which spell a new outlook.

That there will be progress I have no doubt at all. The public and professional conscience is awakening; we are all becoming more sensitive about the needs of the children, to say nothing of becoming conscious of the defects in the training we received ourselves.

The problems are of such a character that every teacher may share in their solution, and the professional associations can do much to accelerate the process.

*Stone & Mallory, "Modern Plane Geometry" (1929), Preface.

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Editorial

GENERAL POST

MIDSUMMER is upon us; the service year has drawn to its close; the signal for the annual fit has sounded; hosts of teachers have taken a parting glance at the scene of a year's labors. A year's cycle is completed, a year of discouragement and disappointment—emanations of the divine discontent where idealism has not shown itself gratified by the results visibly apparent—rendered less burdensome by hopes for a better school and better success next year, is now a thing of the past. Discouragement and disappointment have been displaced in a proportion of cases with that great joy of compensation, for the time being: those who have endeavored to merit the good and faithful servant's "Well done" are made aware that the wistful side glances of little comrades, often too shy or unable to give vocal expression to the regret: "Teacher is leaving and not coming back next year," tell the story of appreciation without words—and more sincerely. Unhappy is the teacher who does not merit this appreciation, better far that he "find" himself in some other vocation for he is "lost" in teaching.

Whatever may be the various reasons why each individual changes school this midsummer or why so many quit the work altogether and so make room for a newly trained graduate from Normal—over 800 of them this year—it is obvious that for every gain resulting from the change there will be a ten-fold loss. This wholesale annual change, this "swapping" of schools every year, is the most blighting breath that blows across our educational system; it is to the education of the young what a violent, dry wind is to the grain fields—tearing at the roots, ploughing up some, smothering others, retarding the normal growth of all, and taking away the prospect of a bountiful harvest. The blighting, withering effect on material wealth is obvious to the naked eye when the hot wind blows, but not so tangible is the arresting of the intellectual, spiritual and moral development of the most valuable treasure of any nation, the citizens to be of the future, left in the wake of the cyclonic change which year by year and term by term sweeps across the teaching personnel and the schools in Alberta. Could this damage be measured in dollars and cents, we venture to suggest that "efficiency and economy" in provincial affairs would take precedence of every other public question but from this most significant angle—that of so organizing our system of education as to safeguard against waste and dissipation of potential teaching power and of preventing the continued existence of all other influences affecting adversely the maximum growth and steady nurturing

of the boys and girls in school. Few who thoroughly understand the problems of education would be prepared to argue that the tremendous annual turnover of teachers is necessary; that the normal annual influx of teachers need to be more than fractional compared with the present 800; that an administrative system could not be evolved which would cut down the number of positions "swapped" annually or semi-annually by 70 or 80 per cent. Until these problems are grappled with in earnest with the real will to achieve; until a prophet, so to speak, arises who will speak with the voice of authority such as will win the populace to a real understanding of the significance of the evil, little progress can be made. The time has come when education must be "sold" to the mass of our public. The public must be led to understand that the present system is effete, costly and wasteful from a business standpoint; that retarded development of pupils cuts down their potential earning power and, consequently, impairs national wealth.

WHEN IS AN AGREEMENT AN AGREEMENT?

UNLESS this year be an exception to the general rule, there will be a host of complaints from both school boards and teachers arising from engagements or alleged engagements being violated. We do not live in Utopia, therefore it is not possible to take for granted that every informal arrangement will be lived up to by either school board or teacher. For this reason it might be well to cover once again the same ground respecting what constitutes a valid and binding agreement between teacher and school board. Every teacher should note very carefully the following sections of *The School Act*:

- (1) 193. A teacher shall not be engaged *except under the authority of a resolution of the board passed at a regular or special meeting of the board.*
- (2) 194. The contract entered into shall be in the form prescribed by the Minister, but such form may be altered or amended as may be mutually agreed upon by the contracting parties:
Provided that such alterations or amendments shall be subject to the approval of the Minister.
- (3) 195. The contract shall be deemed valid and binding if signed by the teacher and by the chairman on behalf of the board.

* * * * *

IF the sections of *The School Act* quoted above be considered carefully there should be no misunderstanding possible. A teacher, however, is very often at the mercy of circumstances which give him no possible chance of assurance that his application has been considered by the school board and that the resolution has been definitely passed in session of the board, formally appointing him to the position. What generally happens is that a secretary-treasurer merely informs the teacher that his application has been accepted and leaves it at that. A teacher replying to the letter is afraid to offend the susceptibilities of his prospective secretary-treasurer by writing

asking if Section 193 of *The School Act* has been complied with; therefore it is safe to recommend that the teacher should see to it that the copies of the agreement are duly signed as soon as possible. It would be as well for the teacher when replying to the secretary-treasurer's letter, to ask him to forward three copies of the agreement properly signed by the chairman; these when received should be signed promptly by the teacher and returned to the secretary-treasurer. Then and then only, there exists a valid and binding agreement between the board and himself.

* * * * *

THE question then arises: "Suppose the school board has appointed the teacher by resolution as per section 193, the teacher has been notified by the secretary-treasurer of such appointment and accepts the appointment, then later the teacher is informed that the board has engaged another teacher—What is the position?" As far as we are able to interpret the court decisions on this matter, we can only say that there would even then be no possibility of the teacher obtaining damages for breach of agreement. The *Morris vs. Castle Hill* case showed that where the school board went back upon their arrangement with the teacher and deliberately deceived her (for example, appointed more than one teacher by resolution, then executed the formal agreement with one and let the others go), the board would be liable in damages for false representation or deceit. On the other hand, if the board had acted in a *bona fide* manner throughout and even after notifying the teacher of her appointment, a hitch occurs in the negotiations before the formal agreement is signed, they could not be held liable in damages. It might be that some further information concerning the teacher, not disclosed at the time of making the appointment, came to the attention of the school board and induced them to change their minds, or that a new situation had arisen in connection with the school which in the opinion of the board required a teacher of a different type to undertake the work—Senior High School Grade pupils, for instance. In our opinion, if the board had in no way deliberately or by implication deceived the teacher, then they could not be held liable in damages.

* * * * *

THERE have been a few cases where teachers have appealed to us for help and advice where, frankly, our sympathy has been with the school board rather than with the teacher. Here is a case where a teacher receives notification of appointment, waits several days before replying and then finding that it was the best or the only offer received, notifies the board of his acceptance of the position. A few days afterwards he received a letter from the board informing him that, being anxious to have the

matter settled and not knowing whether or not he would accept the appointment, the board had accepted another teacher in the meantime. What else could a board do? They had to make sure of a teacher; they had no guarantee of receiving even an acknowledgment of their letter of appointment. As sensible men and loyal trustees they did the only reasonable thing—made sure of another teacher. *Immediately* upon receipt of an acceptance, a teacher should reply either by wire or telephone which should be followed by a letter of confirmation. It is just as unfair for teachers to keep school boards on a "string" as for school boards to do the same thing to teachers. The excerpt below from the Johnson vs. McEwan judgment puts the matter fairly and squarely:

"One can easily see how, under our system of school organization and management, with boards of trustees scattered throughout the province, and school teachers also residing everywhere in the province, and with the boards each trying to get the most suitable teacher and each teacher trying to get the most suitable school, there must at time arise circumstances in which on one side or the other, or perhaps on both sides at once, the second best opportunity will be missed by an endeavor to seize the best. But these conditions must be faced on both sides. Probably a more frequent resort to the telephone and the telegraph rather than the post office would lessen the difficulty."

* * * * *

THUS far we have discussed the liability of school boards in regard to "hitches" in applications and acceptances. This cuts both ways also: a teacher can not be bound legally by any other document other than the prescribed form of the Minister properly executed. On the other hand, a teacher who accepts a position with a school board, knowing at the time of acceptance that it would not likely result in the agreement ever being put formally into effect, is just as guilty of misrepresentation or deceit as a school board who plays the same game with a number of teachers, and in our opinion the teacher could likewise be sued for deceit. However, a teacher accepting an appointment with a school board and finding out certain things after acceptance, which were not apparent at the time, would be entitled to change his mind and cancel his acceptance. Mr. Justice Boyle in the Morrison vs. Castle Hill case—an action against a school board for deceit—sums up the whole situation. After referring to the necessity for a prescribed form of agreement between board and teacher, he says:

"While I think that either teacher or board are at liberty to back out or withdraw at any time during the period of negotiations, up to but not after the contract is signed—if it is done honestly—I am firmly of the opinion that the legislation was never intended to be a shield behind which boards might be free to falsely misrepresent their own proceedings to a teacher to induce her to believe that she and she alone had been selected as teacher for their school in order to keep her on the waiting list to serve their convenience so that she would be still available if their actual choice failed to sign up, *nor to protect the teacher in similar tactics*, and I hold that it does not give such protection."

ARE OUR OBJECTIVES IN EDUCATION VALID?

THE educational situation is admirably summed up by Putnam & Weir, the surveyors of the B.C. School System, in the epigrammatic statement: *The young teacher sets out to teach children. She ends up a slave to the teaching of things.*

The young teacher's ambition is to keep her pupils actively interested, all of them all the time, in such a way as to induce all-round development of their natural abilities and natural tendencies, especially those that tend to success in adult life.

The School Authority, on the other hand, following the precedents of past generations, requires the teacher to cover a prescribed course of studies in a comprehensive selection of subjects; and this task proves so engrossing that the young teacher soon finds her attention fully occupied in spoon-feeding the curriculum and keeping the children swallowing whether they like it or not. She becomes a slave to the things of the curriculum, and has no time to attend to the specific wants of individual children.

* * * * *

THE imposition of a uniform curriculum upon all children is based upon the assumption that the content of the curriculum represents a *general education* such as all children require in the adult life to follow. But, although this assumption may be theoretically valid in itself, results do not justify the attempt to transmit to all children the same round of general education. The underlying reason is to be found in the nature of children, who differ greatly in the direction and intensity both of their individual interests and their individual abilities, and, therefore, in their specific receptivity for different subjects. In consequence of this variation of specific receptivity, the education actually received by the children has by no means the generality which it is the aim of the school to deliver. The general-education theory, in fact, breaks down seriously in practice, and should be abandoned in favor of a more individualistic objective. The school should cease to aim at "teaching things" and try "teaching children" instead.

That there may be serious practical difficulties to be overcome is not denied. But the end to be achieved is worth the effort; and the accomplishment of that end will be a feat of educational engineering, comparable in social importance to those great feats of mechanical engineering of which the present age is justly so proud, and which we esteem great in proportion to the magnitude of the difficulties overcome.

In the pre-school period it is not unusual for children to develop more or less distinct preferences for particular lines of activity, from which

fond parents are apt to draw premature deductions as to the future careers of their children.

Such prognostications might have substantial value were it not that the process of free and selective development is interrupted on entering school. The continuity of vocational tendencies at this tender age can hardly be expected to survive the radical change of *modus operandi*, to which the children are then subjected.

* * * *

THE School of Life, which boasts so many leaders among its alumni, is a *school of experience*; and the pre-school life of children is a characteristic part of it, full of valuable self-training in initiative, experience, and the acquisition of real knowledge of people and things. Why, in the name of all that is sane, does the traditional school abandon the life of experience for the study and memorization of useless abstracts, and substitute the amassing of pre-digested information for the individual pursuit of personal knowledge, and obedient following for practice in individual initiative? Without guidance children instinctively start right for graduation in the School of Life; but the deliberate policy of the traditional school wafts them up into a cloudland of unreality, a world of other people's knowledge which they comprehend but vaguely, and finally drops them back to earth

with only fairy tales and fancies to guide them instead of knowledge and experience of actual life.

* * * *

YET the school itself is not to blame for this misdirection of training. Its practices and policies have the sanction of the people, who generation by generation grow up in the belief, indoctrinated into them by the schools of their childhood and youth during their most impressionable years, that books are the natural repository of knowledge, and book-learning the means of emancipation from arduous toil. That they themselves are still under the bondage of toil they attribute to their own failure to imbibe enough of the medicine, and urge their children to do better. And so on from generation to generation—lockstep. And so it will continue until the people themselves realize the futility of the present policy of their schools and decide to have it brought into line with the methods of the School of Life.

EDMONTON ISSUE

The time has again come round when we must extend thanks and appreciation to the Edmonton teachers who have so ably co-operated in compiling and obtaining material for this, the special Edmonton issue. The issue speaks for itself, but we cannot refrain from adding a formal "Thank You."

New Examinations for Old

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MISS M. CRAWFORD, A.T.A. representative on the Examinations Board, has invited me to submit two articles on the problem of the technique of examination in our elementary and secondary schools.

To attempt to present anything resembling a thorough discussion of this problem seems to involve the following steps: a careful consideration of the efficiency of the essay type examination, an exposition of the objective or new-type examination, a critical estimate of that method of measurement, and finally, an attempt at the formation of valid conclusions as to the most desirable procedure in the examination of results in our schools.

I would like to suggest, at the outset, that I am by no means a fanatical exponent of the objective examination. On the other hand it would seem that this new departure in examination technique should engage the closest scrutiny of teachers, affecting as it does a vital portion of their function. It is to be remembered that a new departure in measurement of results is concerned not only with departmental examinations, but also with the informal testing program of the teacher during the school year.

That the essay type examination is not universally popular is evidenced by the enthusiasm which has developed over the objective examination. In the past twelve years over forty-five books and monographs have been written on the subject of the reform of examination technique, besides innumerable articles in the educational journals. Nation-wide competitions have been conducted in the United States in the construction of such examinations, and thousands of complete tests have been prepared.

Why do we measure results in our schools? There are three ends which are usually foremost in our minds. First, there is the testing of pupil progress. Secondly, there is the motivation of better work. Lastly, there is the all-important diagnosis of weaknesses and difficulties of the students, with attendant suggestions of needed reviews or reteaching. Any examination technique which accomplishes these ends efficiently may be said to be satisfactory; any system of measurement which fails in these aims may be said to be defective.

There are three types of examinations which are in use today. There is the essay type examination, which requires no introduction in this province

where formal tests of this variety are annually prepared in Grades V to XII inclusive. Next there is the new-type or objective examination. Lastly there is the standardized test, which usually takes the form of an objective examination which has been standardized on thousands of students, and for which norms have been established. While of great value in making comparisons and testing progress, they are not suited generally to the informal testing program of the teacher. Dismissing the standardized test, for the moment, we have the essay type examination and the objective examination competing for our attention.

The essay type examination, though it is at present the popular method of measurement of results in this province, has, admittedly, its weaknesses. The first great criticism of it lies in the subjectivity or unreliability of its method of scoring. Starch had an English examination, with its original errors, multigraphed and graded by one hundred and forty-two experienced teachers. Their valuations of the paper ranged from 50% to 98%, a variation of 48%. Ruch distributed copies of a student's paper in History among one hundred and fifteen teachers, whose marks varied from 25% to 85%, a spread of 60%. Starch sent copies of a student's paper in Geometry to one hundred and fifteen teachers. Their marking varied from 28% to 92%, a variation of 64%. These figures suggest that teachers cannot and never will be able to grade, with reasonable accuracy, an essay type examination paper, without a definite marking scheme arrived at in conference. Even when such a conference occurs, one feels that while the poor papers and possibly the excellent ones are carefully and accurately marked, many of the papers of the above average student receive imperfect correction. For further proof of the inability of teachers to mark essay type examinations accurately, you need only go to any large high school where two teachers are teaching the same unit. Assuming that their classes are of somewhat equal ability, you may find that at the Easter tests, one fails fifty per cent of his class while the other fails twenty-five. What is the reason? Simply that the essay type examination is marked subjectively, according to the personal standards of the teacher, and not in any scientific fashion.

A second criticism of the essay type examination lies in the fact that there is a limited sampling of the student's knowledge. The long three hour ordeal of a final examination permits the answering of only six, seven or eight questions. These questions cannot hope to cover more than a small percentage of the year's work. The results gained from such a cursory testing of the student's year of study can hardly be regarded as an accurate measurement of his standing in that subject.

A third and related criticism is the matter of the time required in writing an essay type examination. Ruch estimates that over fifty per cent of the student's time is consumed in writing down the composition of the answer, the filler words, or verbiage, and that less than half of the time is spent in thought, organization of the material, and planning of the knowledge involved in the answer. My own inclination is to feel that in English and History, at least, far more than fifty per cent of the time is consumed in the composition of the answer. This means that the time utilized in testing the knowledge and

ability of the student in the subject is a small portion of the actual time spent writing the answer to the examination.

A fourth criticism lies in the fact that bluffing is encouraged in this variety of examination. When the student is puzzled, the tendency to "get something down" proves irresistible. He can pretend to misunderstand the question; he can resort to garbled statements, wordiness, or ambiguities, and thus fail to meet the problem squarely. We all know that students of a certain type develop a high degree of artistry in this department, and we are all aware how hard it is to avoid giving the student some credit for such an answer. We are almost intimidated by the bulk of the answer into giving unearned credit.

Then there is the problem of unjust penalization of the non-English student, or the student who is poor in expression. You may say that this is desirable. To be logical, when you are testing a student's ability in a specific subject, let us say Chemistry, it would seem reasonable that your result should indicate the student's ability in that subject, and in it alone. Your mark should reflect his ability in Chemistry, not in Chemistry and English. The poor student in English should be penalized at the proper time, on the English examination, and not in other subjects, where aside from expression, he may excel.

Another criticism, which excites much discussion, is that the essay type examination fails to diagnose the weaknesses of the students. In any answer where results come from the aggregate of many and varied exercises and skills, your results show the attainment of the students, but in a fashion which conceals wherein they are weak and wherein they are strong. To illustrate my point, let us take the ordinary translation exercise, English into French, of the language examination. The student's mark on such a question reveals his proficiency, but fails to advise the teacher of his weakness or the weaknesses of the class. So in the essay type, the bulking of fields examined, or of skills tested, defeats the teacher's attempt at diagnosis of weaknesses of the students.

Lastly, there is the cross which all teachers must bear—the marking of interminable examination papers, sometimes three or four times a year. Tired eyes, bodily fatigue, and mental depression from the long ordeal are strong arguments against an examination technique, if human means can devise an efficient substitute, which would even lighten the load.

These, then, are the commoner criticisms of the essay type examination. On the other hand it is only fair to indicate the points of superiority of this method of measurement, for the continued use of this system of testing suggest that these exist.

The first great argument lies in the fact that an intensive testing or measurement of a student's knowledge of a given topic is made. There is no presentation of scrappy, isolated, unrelated items of information. The student must present evidence of a complete, thorough, and detailed knowledge of the topic being tested. This is one source of strength in the business of measurement which cannot be overlooked.

The other great argument for the essay type examination is that such an examination tests the student's power or ability in a subject as no other

method can. To make the point definite let us consider Geometry or History. Here the marshalling of a few facts is insufficient. The ability of the student is not expressed by a parrotlike repetition of isolated facts. His knowledge of the subject is measured by his ability to recall these facts, to organize them and to manipulate them into significant and reasoned bodies and systems of information. Unless the student has this power he is a sorry student of Geometry or History, if we retain these two subjects as examples.

Applying the criteria which I have mentioned above, we find that the essay type examination does not test pupil progress accurately. It may motivate work, but can hardly do so efficiently when student and teacher realize that the scoring is inaccurate. Lastly it does not diagnose the weaknesses in students or classes, nor indicate programs of reviewing and reteaching.

It has the prime merit, however, of testing the field of knowledge which it does test, intensively. Above all it tests power and ability in the recalling, organization, manipulation and judgment of materials in a subject.

Now, let us turn to a consideration of the objective examination. Here we have a new procedure of examination, wherein the factors of the thoughts, feelings, and opinions of the examiner, in a word the subjective side of examining, have been replaced by a technique so impersonal, so standardized, and so accurate, that scientific marking results, whether the marker is a child of fifteen or an old experienced teacher.

An exposition of the objective examination is difficult. It is a hybrid, since it is composed of many varieties and types. The development of new types goes on continually. To make the discussion concrete, I will submit examples of a few of the main varieties. They fall into two main classes, Recognition Types and Recall Types.

RECALL TYPES

1. Simple Recall.
2. Completion.
3. Short Answer.
4. Computations.
5. Constructions:
 - (a) Mathematical.
 - (b) Science.
6. Analogies.
7. Reproduction.
8. Correction of Errors.
9. Map Location.
10. Deduction of Conclusions.
11. Date—Event.

RECOGNITION TYPES

1. True—False.
2. Yes—No.
3. Converse True—False.
4. Multiple Choice or Response with two, three, four or more alternatives.
5. Best Answer.
6. Matching, Imperfect and Perfect, and Multiple.
7. Rearrangement, Order of Operations, and Chronologies.
8. Cause—Result.

These are a few of the commoner types, classified as to whether they require recall of information, or recognition and rearrangement of the facts or materials presented.

Now let us examine a few of these types.

RECALL TYPES.

1. Simple Recall.

After each province write the name of its capital city.

- (a) Nova Scotia.....
- (b) New Brunswick.....
- (c) Quebec.....

- (d) Manitoba.....
- (e) Alberta.....
- (f) British Columbia.....

2. Completion Type.

In the following sentences apply the name of the explorer indicated:

1. The Arctic Ocean was first reached via the Coppermine River by.....
2. was the first man to discover Lake Athabasca.
3. The Pacific Ocean was first reached by land by.....

3. Short Answer Type.

Explain in one sentence in the space provided what connection each of the following had with Goldsmith:

1. Sir Joshua Reynolds.....
2. Garrick.....

TRUE—FALSE TYPE.

Underline the "True" or "False" according to your judgment of each statement.

1. Macbeth thought of the murder after hearing the witches. True False
2. The witches said that Macbeth could not be conquered. True False
3. Malcolm suspected Macduff of treachery. True False

MULTIPLE RESPONSE OR BEST ANSWER.

1. Multiple Response.

Underline the correct response in each case:

1. Substances which hasten a chemical reaction without themselves undergoing chemical change are called: Catalysts, electrolytes, ionogens, allotrops, colloids.
2. Ammonia is obtained as a by-product from the manufacture of: Fertilizer, liquid air, coal gas, soda, soap.

2. Best Answer.

Place a cross before the best answer in one of the following cases:

Fungus plants are dependent upon other plants for their food supply because:

- (a) They are so simple in structure.
- (b) Their digestive processes have never developed.
- (c) The absence of chlorophyll prevents photosynthesis.

MATCHING TYPE.

Place the name of the industry or product after the city in which it is found.

1. Paris..... Silk
2. Limoges..... Wine
3. Bordeaux..... Pottery
4. Glasgow..... Coal
5. Cardiff..... Ship Building
6. Liverpool..... Art
7. Lyon..... Fish

CORRECTION OF ERRORS TYPE.

Draw a circle around any error or omission in spelling, punctuation, capitalization, or grammar in the following sentences. Correct each error found by writing the correct form on the dotted line immediately opposite:

1. I seen him yesterday.
2. The meeting was called by mr. Jones.
3. Who is that man.
4. What a pity! she exclaimed.
5. You the leader, should go first.

CHRONOLOGIES TYPE.

Rearrange the following events from the first two books of the Aeneid in the order in which Vergil tells about them, using numbers in the spaces provided:

- The banquet in Dido's palace.
- The struggle in the palace of Priam.
- The death of Laocoon.
- The storm off the coast of Sicily.
- The vision of Hector appears to Aeneas.

COMPUTATIONS TYPE.

Write answers on dotted lines. Use margins for necessary calculation or diagrams.

1. The diameter AB is the base of a triangle formed by inscribing an angle ACB in a semicircle. Angle B equals 30 degrees. Angle A equals.....
2. Angle A equals 34 degrees. What is the magnitude of Angle B, its complement?

CAUSE AND RESULT TYPE.

In each group below draw a line under the one event which was the result of the other three:

1. Stamp Tax. Downfall of French power in America. Policy of George III. American War of Independence.
2. Right of Search. War of 1812. Berlin Decrees. Orders in Council.

A few suggestions concerning the construction of these tests might be desirable. The first step is to draw up a list of the topics which you wish to test. Next assign the type of test you are going to use to each topic being tested. A satisfactory objective test utilizes a number of types, rather than one or two. Next construct the items in preliminary form for each field. It is wise to have many more items than you really need. The editing of items comes next, when the very easy, or very difficult, or the ambiguous items are deleted. The items in each topic should be arranged in order of ascending difficulty. The marking plan can be settled now, and

the instructions which accompany each question filled in.

Now you are ready for the preparation for correction. The characteristic of the new-type test is that the student fills in only a small portion of the answer sheet. This makes possible rapid correction. A sheet of cardboard or transparent stencil is placed over the answer sheet. Apertures where the student's answer will appear, are cut. Below each aperture you may place the correct answer. The marking can be entered in an exposed margin of the answer paper. Thus you have provided for speedy, accurate, and objective marking.

In arriving at your marking scheme, you may give 1-2-3 or more marks per item as you may feel desirable. There are a few peculiarities of special tests which need comment. In the True-False or Yes-No type of test the marking formula is Rights-Wrongs. In this test the student's problem is recognition. He can guess, and, without a knowledge of the subject, secure fifty per cent if the law of averages holds good. To forestall this he is warned that a wrong answer results in the subtraction of a mark from the total.

This penalizes a trifle vigorously, but, with a trained class, guessing will be largely eliminated. I have not convinced myself that this type of a test, however, is as valuable as others on which I will comment later.

In the Multiple Choice Type the formula used in marking is R- $\frac{W}{N-I}$

where R means right answers, W, wrong answers, and N, the number of choices or alternatives. Here again experiment suggests that the penalization of the student is rather severe.

This completes a brief and necessarily inadequate exposition of the objective examination. In the next article I propose to consider the points of strength and of weakness in this method of measurement of results, the attractiveness of each of the various types, and finally to suggest a working partnership between these two systems of examining pupil progress which should appeal to progressive teachers, whether in elementary or secondary education.

THE REAL SCOTLAND YARD

When Governor Roosevelt, of New York, proposed the formation of a New York State Crime Commission, to be a bureau of experts similar to England's Scotland Yard, he interested all Americans who love detective stories. Scotland Yard is a name that has become a household word for a body of expert detectives.

Scotland Yard was originally (and still is) the name of a street in London. Until 1890, this Scotland Yard, off Whitehall, was the headquarters of the Metropolitan Police. These headquarters are now located at New Scotland Yard, on the Thames Embankment.

But Scotland Yard became identified with the detectives who made their headquarters there. "Hence," explains Webster's New International Dictionary, defining Scotland Yard, "figuratively, the Metropolitan Police force at headquarters, especially the detective department."

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ALBERTA

The Present Status of the High School Syllabus

J. G. NIDDRIE, M.A., B. PAED, Strathcona High School, Edmonton

I DO not believe there ever was a time when such a critical eye was turned upon the curricula of our high schools as at present. There appears to be an ever-growing conviction among educationists—and laymen as well—that there must be an adjustment made of the old traditional boundaries of secondary education, and a more scientific arrangement of both cultural and practical subjects. We have surely reached a new chapter in the history of education—a chapter where there is a clear break with the past. The enormous growth of population, the terrific efficiency of the machine, the rapidity of communication, the liberation of labor from age-long serfdom, new demands for leisure and luxury, such as were never dreamed of by our fathers, have created problems that even stagger the imagination. The specific formulæ of the high school curricula must be dictated very largely by these considerations.

The truth is that the remarkable advance in science within the last fifteen or twenty years has so leaped the barriers of knowledge that our educational programmes are in danger of being left away behind, almost out of sight. Hence a thorough examination of our curricula in the light of a sound and acceptable educational philosophy of education is becoming more and more insistent. The problem of the relative value, utilitarian and cultural, of the commonly accepted branches of learning is yet unsolved. Their content, too, must be put to the test. Recent discoveries have brought such a train of new equipment that much of the traditional type of learning must fall by the wayside.

The day is now at hand when many of the traditional subjects must be radically changed, or, shall I say, reformed. Their purpose and content must be worked out in the light of present day philosophy. I might point out specific examples where reform in both purpose and content appear to be imminent.

In our history courses—the emphasis has been all too often wrong because, not infrequently, it has been placed merely upon the more successful military exploits of the nation to which child and teacher belong, presumably with a view to stimulating a type of bloated patriotism. It is clear that if international anarchy is to be done away with, history will have to be taught, not as a record of military achievement, but as a story of the common adventure of the whole human race. The history of our own day should be the liveliest topic of all. How much better would it be for the pupil, instead of groping his way through the barbaric invasions, the feudal age or the foreign policy of the Tudors, to spend part of the time at least, on what has been achieved in the way of international co-operation. Pupils (yea, and many parents and teachers, too) do not realize what has been accomplished through arbitration treaties, e.g., Hague Courts, League of Nations, International Labor Office, etc. If human history, as H. G. Wells aptly puts it, is a race between edu-

cation and catastrophe, then all high school courses on the subject must be reformed and worn-out tales of quarrels between king and king, between nation and nation, must be discarded; if studies in history are to contribute to world citizenship they must equip boys and girls to face the solution of those problems of social character which the modern world faces; they must be taught a broader, cosmopolitan type of citizenship.

Or, to take another example where reform must be instituted. We are living in a scientific era such as the world has never known. It would appear, then, that the basis of our science courses should rest upon positive human interests. In our biological studies, for instance, such tremendously important topics as human physiology, hygiene, genetics, evolution, should be given some emphasis. Perhaps our social science and our natural science courses are in the greatest need of reorganization.

But the chief handicap to the best progress of students in our high schools has been the fallacy that in a democracy such as ours it was inherently wrong to make distinctions between one mind and another. This notion has obliged us to try to put a mahogany finish on every spruce board that came along. Equality of opportunity, of course, but not equality of treatment for all pupils, dull and bright alike. It is gradually being realized, however, that our high schools must make distinctions where nature has made distinctions. Each must have a chance at an education—democracy means that; but it does not mean that the bright lad must passively wait for his slower brother to catch up with him.

With the wealth of educational experiment that is going on all over the New World, one has reason to think that we are entering upon a new era in the practice of secondary education. Let us hope that a new liberal education will spring up that will make the student assume a more important role in his own education, by breaking down the artificiality of intense specialization through the departmentalizing of learning, and by recognizing the obvious fact that democracy in education does not mean a common level of effort for all students so much as education for all students at their own level of capacity and effort.

To conclude, may I prophesy that the day is dawning when the public will demand a more democratic return for the millions they are now expending on education for the masses? The tremendous waste that is now suffered by attempting to force thousands of high school pupils through a system that nature never intended for them must come to an end. How this will be done I will not venture to prophesy; but I do feel assured that the next ten or fifteen years will witness a revolution between new liberties and the need of discipline; between moral anarchy and Christian ethics; between old tradition and new pragmatism. The outcome will make one of the most interesting chapters in human history.

EDUCATIONAL RESEARCH DEPARTMENT

EDITED BY M. E. LAZERTE, PH.D.

DIFFICULTIES WITH ADDITION IN ALGEBRA

ON my desk lie reports giving details concerning over two hundred errors in addition in Algebra I. The nature of the common errors is revealed in the following summary:

Type of Error.	Example.						
1. Unlike terms are combined.	$\begin{array}{r} 3x \\ 10 \\ \hline 13x \end{array}$						
2. Procedure is governed by rule instead of by understanding.	$\begin{array}{r} (a) \quad +4a \\ \quad -3a \\ \hline \quad -7a \end{array}$ <p style="text-align: center;">"Two different signs give a minus."</p> $\begin{array}{r} (b) \quad -6x \\ \quad -6x \\ \hline \quad +12x \end{array}$ <p style="text-align: center;">"Like signs give plus."</p> $\begin{array}{r} (c) \quad -12 \\ \quad +15 \\ \hline \quad -27 \end{array}$ <p style="text-align: center;">"A minus and a plus give a minus."</p>						
3. Unit is changed.	<table><tr><td>$\begin{array}{r} (a) \quad 4a^2 \\ \quad 6a^2 \\ \hline 10a^4 \end{array}$</td><td>$\begin{array}{r} (b) \quad 3x^2 \\ \quad 2x^3 \\ \hline 5x^5 \end{array}$</td><td>$\begin{array}{r} (c) \quad 6ab \\ \quad -8ab \\ \quad -5ab \\ \hline +6ab \end{array}$</td></tr><tr><td colspan="3">$\quad \quad \quad -a^4b^4$</td></tr></table>	$\begin{array}{r} (a) \quad 4a^2 \\ \quad 6a^2 \\ \hline 10a^4 \end{array}$	$\begin{array}{r} (b) \quad 3x^2 \\ \quad 2x^3 \\ \hline 5x^5 \end{array}$	$\begin{array}{r} (c) \quad 6ab \\ \quad -8ab \\ \quad -5ab \\ \hline +6ab \end{array}$	$\quad \quad \quad -a^4b^4$		
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$\quad \quad \quad -a^4b^4$							
4. Signs are changed.	<table><tr><td>$\begin{array}{r} (a) \quad 6ab \\ \quad -8ab \\ \quad -5ab \\ \hline +6ab \\ \hline +ab \end{array}$</td><td>$\begin{array}{r} (b) \quad a-2b+c-3d \\ \quad 6a+3b-c+7d \\ \hline 7a-b-4d \end{array}$</td></tr></table>	$\begin{array}{r} (a) \quad 6ab \\ \quad -8ab \\ \quad -5ab \\ \hline +6ab \\ \hline +ab \end{array}$	$\begin{array}{r} (b) \quad a-2b+c-3d \\ \quad 6a+3b-c+7d \\ \hline 7a-b-4d \end{array}$				
$\begin{array}{r} (a) \quad 6ab \\ \quad -8ab \\ \quad -5ab \\ \hline +6ab \\ \hline +ab \end{array}$	$\begin{array}{r} (b) \quad a-2b+c-3d \\ \quad 6a+3b-c+7d \\ \hline 7a-b-4d \end{array}$						
5. Wrong operation used.	<table><tr><td>$\begin{array}{r} (a) \quad 4a^2 \\ \quad 6a^2 \\ \hline 24+a^4 \end{array}$</td><td>$\begin{array}{r} (b) \quad 10m \\ \quad 5n \\ \hline 15mn \end{array}$</td><td>$\begin{array}{r} (c) \quad a-2b \\ \quad 6a+3b \\ \hline 7a^2+b^2 \end{array}$</td></tr></table>	$\begin{array}{r} (a) \quad 4a^2 \\ \quad 6a^2 \\ \hline 24+a^4 \end{array}$	$\begin{array}{r} (b) \quad 10m \\ \quad 5n \\ \hline 15mn \end{array}$	$\begin{array}{r} (c) \quad a-2b \\ \quad 6a+3b \\ \hline 7a^2+b^2 \end{array}$			
$\begin{array}{r} (a) \quad 4a^2 \\ \quad 6a^2 \\ \hline 24+a^4 \end{array}$	$\begin{array}{r} (b) \quad 10m \\ \quad 5n \\ \hline 15mn \end{array}$	$\begin{array}{r} (c) \quad a-2b \\ \quad 6a+3b \\ \hline 7a^2+b^2 \end{array}$					
6. Arithmetic computation at fault.	$6+4=9$						
7. Techniques mastered when brackets are used do not function when addition is in column form.	$\begin{array}{l} (3a-2b) + (2a-b) \\ \text{is given as} \\ 5a-3b \\ \text{but } 3a-2b \\ 2a-b \\ \hline 5a-b \end{array}$ <p style="text-align: center;">is also given.</p>						
8. A zero causes confusion.	$\begin{array}{r} a+2b+c \\ 6a-3b-c \\ \hline 7a-b.0 \end{array}$						

Major Difficulty is not with Arithmetic

Teachers of primary grades are quite accustomed to analyzing simple errors in addition and they devise remedial exercises and drill material to meet the pupils' needs. In Algebra we are less analytical at times and censure the elementary grade teacher for sending us pupils poorly trained in Arithmetic, instead of looking for basic causes. Over seventy-five per cent of the errors typified in the above summary bear no visible relation to primary school Arithmetic. These errors are due to defects in algebraic thinking. One cannot hold the primary teacher responsible for short-comings in Algebra.

Algebra Quite Different from Arithmetic

If one introduces a class to algebra with the remark that algebra is really very much like arithmetic, he must for the time being overlook the fact that algebra and arithmetic are essentially unlike. Arithmetic stresses computation and results; algebra is concerned with general processes. The generalization is all-important in algebra; the particular answer is sought in arithmetic. Many of the early errors in algebra result because pupils do not appreciate these facts. In trying to add $3x$ and $5x$ the pupil manipulates the x 's, probably deducing a " $2x$ " or an " x^2 ," instead of focussing attention upon the ideas "3 and 5," "addition" and "any common unit." The pupil who particularizes his algebra for one or two years fails after that amount of manipulation to appreciate the generalizations which may be used to illuminate particular sets of data.

Difficulties Should be Drilled Upon Singly

Frequently when trying to add, say, $+6xy$ and $-9xy$, the pupil has several difficulties instead of the one upon which the exercise is supposed to furnish drill. The pupil might profit by drill on $+6$ and -9 detached from literal coefficients; he may not understand the real relation of the "6" to the " xy "; he may not know what the symbol " xy " means.

Faulty Attitudes

Errors may be due to lack of confidence. A few pupils become bewildered when they do not understand the reasons for classroom routine. One pupil in adding $+2$ and $+5$ obtained -3 as an answer. When the procedure was questioned, she replied, "Yes, I could do that in arithmetic, but I thought this was algebra."

Rules are but Abbreviations

It is very evident that many pupils, lacking understanding of the work in hand, fall back upon rules which have been memorized. Under 2 above are a few examples of rules gone wrong. From Grade I to Grade XII pupils who are given rules instead of meanings are likely to use the rule when it does not apply. It is fairly sound practice to keep the rule from a pupil until he understands its meaning and its proper application.

Old Habits of Thinking are Frequently Opposed to New Demands

Many difficulties in elementary algebra are rooted in the fact that old trusted generalizations do not fit new situations that arise. For example, 96 has a meaning that finds its value at almost one hundred, but, in algebra, the pupil meets xy of similar form and is asked to interpret it in a way that would make the familiar 96 have a value little more than fifty. In past experience "to add" has meant "to increase." The pupil now faces adding situations where his old notions must be revised.

The student of Algebra I must learn a new language. There are new symbols, new conventions and revised generalizations to be mastered. Progress must be slow until the pupil masters the language of the subject. Probably many of the two hundred errors mentioned above would have been avoided if the pupils had not been hurried over so much new work in the first month. More time on symbols, language, conventions and meanings with less time devoted to answer getting may be essential. The confused pupil searching for rules may write $13x$ as the sum of $3x$ and 10. Less confusion with more implicit reliance on rules may permit a pupil to give $3x+10$ as the desired sum and yet this result may be a cold, static, meaningless item. Think for a moment of the joy and mental growth that would result from viewing at this stage the $3x+10$ as a dynamic, elastic, variable quantity as far removed from $13x$ as are a pair of opposites.

Summary

The evidence upon which this article is based supports the view that only a small percentage of the errors in introductory algebra are due to inefficiency in arithmetical computation. Errors appearing in various forms are due really to lack of understanding of the meaning of the subject and of the symbols and nomenclature used therein.

The pupils who give $6a^2b^2$ as the sum of $2ab$ and $3ab$, who give $13x$ as the sum of $3x$ and 10, or who record $10+2a^2$ as the sum of $4a^2$ and $6a^2$, may all need the same remedial treatment. These pupils lack orientation in a new field of study. They do not understand the language, the symbols and the nomenclature, and as a result they misapply rules and hazy generalizations.

MENTAL TESTS IN HIGH SCHOOL ADMINISTRATION

C. O. HICKS, M.A., C. B. WILLIS, M.A., D. PAED.
Edmonton

EARLY in April, 1930, the Terman Group test of Intelligence was administered to all Grade IX pupils and to a few of the Grade X and XI pupils in the Victoria High School, Edmonton. The test was given to aid in the solution of three administrative problems:

(a) Which pupils would be certain or extremely likely to find the Academic Course in High School unsuited to their needs and mental capacity?

(b) Which pupils are not working up to capacity?

(c) What advice could be given to pupils along the lines of vocational guidance?

As a check up on the validity of the test, the correlation was found between the I.Q.'s obtained by

this test and the I.Q.'s for the same pupils on the Terman individual test—the latter having been obtained for 35 of the pupils at some time during their public school course. The correlation was found to be only .55 with a probable error of .12. This is far from sufficiently high to be accurate, but due to the small number of cases this correlation is not very reliable.

The distribution of I.Q.'s as given by this test did not conform to the distribution usually found and a careful comparison showed that the two were comparable at I.Q.'s 90-93 and that one point must be added to the group I.Q. for every four points above this point of equality or subtracted for each four points below—a maximum of seven points being added or subtracted.

With regard to the interpretation of the I.Q. and prognosis of school achievement based on it, the following table shows the probable standing for pupils of various I.Q.'s in Grade VIII to XII in a class of 35:

I.Q.	VIII	IX	Grade X	XI	XII
140	1	1	1	1-2	1-3
130	2	3	4	5	6
120	5	7	9	11	13
110	13	15	18	21	24
100	21	25	29	31	33
90	30	32	34	35	
80	34	35			
70	35				

It will be noted that a pupil of I.Q. 100 will stand slightly below average in Grade VIII and will gradually drop down in the upper grades, as those of I.Q. below 100 drop out, until in Grade XII he is not far from the bottom of the class.

For Grade IX, the educational age, which corresponds to the class mark of each pupil, was found. From this and the chronological age was found the educational quotient, or E.Q., which shows what percentage a pupil's achievement bears to the average achievement for his age. Thus a boy of age 15 years who had the educational achievement of the average boy of 12 years would have an E.Q. of 80. If his I.Q. were found to be 80 also, he would be doing average work for his age and mental level. If his I.Q., however, were 90, he would not be working up to capacity.

A comparison of the average I.Q. and E.Q. of various Grade IX rooms is as follows:

Room	E.Q.	I.Q.
A	98.0	99.4
B	108.6	99.5
C	106.1	100.9
D	100.6	102.1
E	100.4	104.4

Room E was found to be doing work much below what it was capable of doing, the I.Q. being much above the E.Q. An effort was made by the principal and teachers to arouse the pupils of this room to greater effort and very considerable results were accomplished. The other rooms showed a commendable amount of effort, particularly rooms B and C, so in these rooms the "pepping-up" process was confined to individual pupils.

In the case of foreign pupils the average E.Q. was found to be five points higher than the average I.Q. Since, even the educational results are subject to

a language handicap, it seems probable that the mental test gave pupils of foreign extraction, on the average an I.Q. about ten points too low, though this varies from pupil to pupil and has a variation probably from 0 to 20 points for High School pupils.

It was found that Literature and Algebra both selected or rejected pupils of low ability about equally well. Of pupils of I.Q. below 90, a slightly greater number were in the lowest 30 per cent on the Literature mark than on the Algebra mark, also similarly for I.Q. 90-99. In class marks pupils of age 13 averaged better than those of age 14, those of age 14 better than those of age 15, etc.

In order to get at two of the main points basic to the study, the I.Q. and E.Q. were tabulated for all Grade IX pupils. In the case of about 25 per cent of the pupils, the E.Q. was markedly below the I.Q. These pupils were interviewed by the principal and an effort made to get at the reason for the falling off in educational achievement. A number of pupils when confronted with the evidence that they were not working up to capacity expressed the intention of doing better work and in a number of cases these pupils appear to be making considerably better progress.

Various reasons were found for the poor showing of these pupils. Some of these reasons are: lack of

serious attitude to work, lack of sufficient home study, not interested in school, no satisfactory place at home to study, etc. In the majority of cases, remedial measures were promised.

About 26 of the Grade IX pupils or about 15 per cent were found to be very unlikely to obtain any benefit from taking the work of the Academic High School and would be well advised to study along some other lines or to obtain employment. While these 26 are almost certain to obtain little benefit from the High School course, quite a number of others are unlikely to benefit materially by it, but these cannot be distinguished with as great a degree of certainty as could the 26 of I.Q.'s below 90 and unsatisfactory class work.

This study has led to new lines of investigation and the following measures are under consideration:

1. Mental testing of all Grade IX pupils early in September.
2. Advising pupils of I.Q. below 90 and low Grade VIII marks not to attempt the work of the Academic High School.
3. Sectioning Grade IX pupils on one of the following bases:
 - (a) Intelligence quotient.
 - (b) Mental age.
 - (c) Grade VIII marks.

"The Virtue is Not in the Staff"

G. A. MCKEE, B.A.

Superintendent of Schools, Edmonton

AT the last convention of the Department of Superintendence, held in Atlantic City, two addresses were delivered in juxtaposition on the programme, one "Teaching as an Applied Science," by Professor Freeman of Chicago University, and the second "Teaching as a Fine Art," by Professor Bagley of Ohio University. Both of these men are distinguished United States Educationists. I would like to pass on Professor Bagley's perspective of the situation which has quite an appeal to me.

"The scientific attitude may well be regarded as a most desirable part of the equipment of the artist teacher. It is in no sense inconsistent with other items in this equipment. Among the latter I would list—

- "1. A thorough-going mastery of the materials one teaches.
- "2. A keen appreciation of the significance of these materials to human life.
- "3. An ardent desire to have others know and appreciate these materials.
- "4. A sympathetic understanding of the difficulties which the learner will encounter in mastering these materials.
- "5. A command of the technique by which these difficulties may best be overcome.

"Regarding the last named desideratum, it is reasonable to believe that many, if not most, of these techniques will be gained in part from the observation of master teachers and in part from the discipline of experience. The technology of education will, I think, help the teacher somewhat

here, although it will not alone solve the problem. I am inclined to think that the technology of education will be of largest service in what may be called the extra-teaching activities as caring for the health of learners, measuring their progress, and such duties as may devolve upon the teacher in determining what subject matter to teach.

"Far more significant to the artist teacher than the techniques, however, are the qualities of appreciation and sympathy and devotion which come primarily neither from his instruction in the materials and technologies of his art nor from his specific training during the apprenticeship stage of his career, but rather from the forces, no less real but far more subtle, that we refer to as insights and intuitions and inspirations. Like all true artists, the artist teacher is a sensitive soul—sensitive to the finer and more humanly significant elements in the subject matter that he teaches, sensitive, as well, to the finer and nobler elements in those who come to him for instruction and inspiration and guidance."

If I understand Professor Bagley correctly, he seems to imply that scientific methods are applicable in the development of methods and technologies but that it is a different matter in respect to that *something* in the teacher which constitutes the *real* teacher. The very same idea, that it isn't the method or the technology but something behind the method and technology which makes the real teacher, was brought out in a unique way in an article which I read some time ago in the *British Weekly*:

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ALBERTA

"In one of the stories of the Old Testament, we read that Gehazi laid his staff upon a dead child, 'but there was neither voice nor hearing. Then Elisha went in therefore and shut the door upon the twain, and prayed unto the Lord. And he went up and lay upon the child and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands, and he stretched himself upon the child and the flesh of the child waxed warm . . . and the child sneezed seven times and the child opened his eyes.' It seems a quaint, bizarre story of a distant and credulous age and appears to be utterly remote from today. In reality it throbs of modernity and sings of life and everyday fact. There is no virtue in the staff; it is not the weapon that counts, but the inspired man who wields it. In the Louvre there is to be seen Corot's palette and brush. But that brush has no magic in it. If we used it today we could not paint pictures wet with the dew of the morning, nor moist with the mist of the early dawn. If we borrowed the bat of Hammond, it would not enable us to score a brilliant century. A friend of mine once bought a club out of the golf bag of Harry Vardon but that did not lower his handicap nor improve his game. If we could find the pen which Bunyan used, we should not write with his magic. It certainly is not in the staff that power resides. There are always those of the tribe of Gehazi who think so, and they strut pompously into the room and work by rote 'but there is neither voice nor hearing.' It is not the staff that works the miracle, neither is it the unaided man behind the staff. If we add up all we know about Shakespeare, we have not revealed the secret of the author of 'Hamlet,' 'King Lear,' and 'The Tempest.' It was not the man Shakespeare who wrote the deathless plays but the inspired man, the man who waited until he heard the heavenly music, and upon whom the inspiration fell. It is thus ever the way with genius."

The task of the teacher is the most difficult task that anyone can undertake, and yet I am oftentimes startled at the abandon with which young men and women plunge into the sea of pedagogy. As to the difficulty of our task let me again quote from Dr. Bagley's address. This is a statement made by Henry Fairfield Osborn, one of the most distinguished American scientists in the biological field.

"Marvelous as are the recent discoveries in astronomy they are becoming comprehensible because of the uniformity of the laws and principles revealed to man through centuries of research. In brief, physics, astronomy, and chemistry are alike coming within the field of exact science capable of measurement, calculation, prediction and prophecy.

"What a contrast is presented in the biological sciences, ancient and modern. With a wide circle of astronomic friends and with a most intense admiration for the achievements of astronomy and pure mathematics, I yet believe that their problems are not nearly so difficult or so baffling as our problem. In anatomy, in physiology, in pathology, in heredity, we have not yet reached even the threshold of exactitude. With increasing energy, refinement, and ingenuity, we know all the organs revealed in comparative and human anatomy in

both their grosser and their finer structures. We know also the history of the use of many of these organs in the course of past time and what their functions and relations are but there is always the Great Beyond of the unknown and perhaps unknowable which is summed up in the word 'life.'

"Of all the incomprehensible things in the Universe, man stands in the front rank and of all incomprehensible things in man, the supreme difficulty centres in human intelligence, human memory, human aspirations, human powers of discovery, research and conquest of obstacles."

What Dr. Osborn says in effect is that the task of the physical scientist is a simpler task than that of the biologist and that the task of the biologist, difficult as it is, is a simpler task than that of the psychologist. In so far as dependable guidance from fundamental laws and principles is available, the task of the engineer is a simpler task than that of the physician, and the task of the physician, difficult as it is, is a simpler task than that of the teacher.

What kind of teacher do we need in every classroom in our schools?—not the automatic practitioner, skilled in the use of stereotyped methods of performing standardized activities which scientific study has discovered by analyzing what is now considered excellent teaching; not a person who is steeped in theories of teaching and education that he or she has academically learned; but a teacher, the extent and character of whose professional education has prepared him or her to meet successfully the changing conditions with the courage and disposition to attack and the ability to solve with increasing success the new problems which constantly arise. I do not believe that mere refinements in educational technologies, methods and procedures can make a teacher out of a person who may be lacking in those essential personal qualities and impulses which lie at the very base of profitable and efficient interaction between teacher and child. The teacher who has mastered the techniques, methods and procedure but lacks the essential personal qualities and impulses may go through the motions of teaching but the vitality is not there. We have travelled a long way in our improvements in techniques, methods, and procedures and I glory in our advance but "virtue is not in the staff." At our Kiwanis luncheon the other week Dr. George Dickson of Calgary was talking about the old Scottish schoolmasters. They may have been lacking in the refinements of technique and method as we understand them but they were real teachers and had a wonderful knack of seeing the possibilities in a child and developing them. One of the finest demonstrations of the fundamentals of teaching that I ever observed was when a burly policeman, a friend of our family, taught my brother how to swim. He took him down to a pier in the centre of a little lake where the water was twenty to thirty feet deep. This policeman had a very definite objective; he was going to teach the boy how to swim and he wasn't going to waste any time over it. When they were ready, he took my brother up and pitched him in. He then jumped in beside him. I want you to notice that. He didn't stand on the pier waving his arms and saying "do this" and shaking his feet and saying "do that." Then

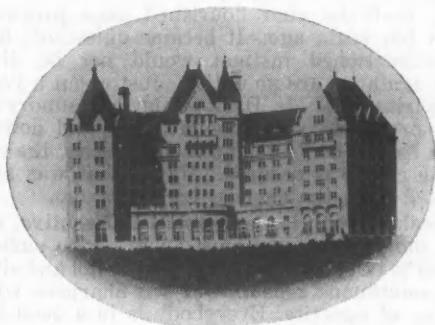
he only gave him the minimum assistance necessary. He directed the boy's efforts but he never did any more for him than was absolutely necessary. In ten to fifteen minutes my brother was swimming all around the place. I do not wish to be understood as advocating the promiscuous use of this method of teaching a boy to swim as one teacher's method does not necessarily suit another. This burly policeman taught me three most valuable teaching principles:

1. He had a definite objective and he didn't waste any time reaching it.
2. He jumped in and got next to his pupil.
3. He made the pupil rely on himself to the limit.

I think that if there are any three things that we teachers need to learn, it is these three.

Upon the teachers of Edmonton, and of every other place for that matter, rests a great challenge and opportunity. There are four hundred and twenty-six of us organized for the purpose of helping some fifteen thousand two hundred boys and girls grow up into fine young men and women and take their places in the life of the community. What a direction to the developing life of the community; what a raising of the level of general citizenship; what a contribution to the personal satisfaction of individuals can be given when four hundred and twenty-six men and women, steadily and consistently, year in and year out, concentrate

the vital force of their personal qualities and skill in technique upon the training of that stratum of our city's population which lies between the ages of six and fifteen years! Both you and I know the tremendous nature of the task and the obstacles with which we have to contend. But that should only serve to make us grit our teeth and put more energy than ever into our efforts. Are we big enough for the job? Or are we going to distract our attention and dissipate our energies by continually attacking the educational system of the day, finding fault with curricula, criticizing text books? It might be a good idea to establish a moratorium in such matters for a period of time at least—possibly for three years at first, as that might be all we could stand without bursting. Let the fourth year be an open season and let us go at things with hammer and tongs and play the iconoclast to our hearts' content. Then, at the end of the year, let us quiet down again and forget it for another three years. This continual criticism of school practice and procedure before the public puts our profession in an unenviable light. The doctors don't go around delivering speeches setting forth the shortcomings of medical administration and medical practice. Through their regular organizations, they bring to bear a rational, orderly and steady pressure in the interests of the welfare of their profession and its practice. This last digression may have spoilt an otherwise fairly decent article even though somewhat overburdened with quotation.



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Local News

CALGARY HIGH SCHOOL LOCAL

Collier Maberley, of Commercial high school, was elected president of the high school local of the Alberta Teachers' Alliance at the annual meeting Tuesday evening, when more than 50 teachers were present.

In his report for the year Mr. Smith, retiring President, stressed the need for greater interest in educational affairs on the part of the citizens. School week had been firmly inaugurated in the city and should continue to hold its place in the community as an important phase of educational achievement, he said.

All the service clubs had listened to educational speakers from the Teachers' Alliance, many of whom had spoken at church services. Mr. Smith stressed the importance of school week and its place in community work.

Miss G. Giles, of Crescent Heights high school, was elected vice-president, and H. B. Love, who has been secretary for the last seven years, was re-elected. Mr. Thorlakson was chosen press correspondent, and Miss M. B. Moore, representative on the National Educational Association. Representatives from each school will be chosen later.

R. D. Webb, provincial president of the A.T.A., outlined the need for a pension scheme. He was given power to choose a committee to approach the candidates in the coming election in an attempt to gain pensions for teachers in Alberta. It seemed unfair to think Alberta was the pioneer in the west in pensions schemes and that the three other western provinces had adopted the ideas of pension schemes which Alberta had pioneered, he said. He spoke favorably, and hoped the government would shortly take action.

—(Calgary Herald.)

EDMONTON HIGH SCHOOL LOCAL

The newly elected executive for the year 1930-31 is as follows:

President—J. G. Niddrie.
Vice-President—C. M. Scarborough.
Treasurer—Capt. H. J. Towerton.
Secretary—E. Garlough.

EDMONTON PUBLIC SCHOOL LOCAL

The Edmonton Public School Local has also commenced upon a new financial year under the following executive:

President—T. E. Hughes.
Vice-President—A. J. Skitch.
Past-President—G. A. Clayton.
Secretary-Treasurer—A. Stockwell.

REPRESENTATIVES:

Principals of Large Schools—G. G. Harman.
Principals of Small Schools—Miss M. E. McIvor.
Male Assistants—N. S. Fitzsimmons.
Lady Vice-Principals—Miss C. B. Pattullo.
Special Teachers—Miss L. G. Parnell.
Grade Teachers—Mrs. I. G. Ringwood.

"WE HAVE WITH US TONIGHT—"

They say man is a gregarious animal. Certain it is that the genus "paedagogus" loves to consort with his fellows periodically. Witness the Edmonton Public School Men's Club as a boldly-conceived and ably-executed means of satisfaction of the urge of this instinct!

I am led to believe, by the "old reliables" of the staff, that the club flourished once previously—about ten years ago. It became quiescent; but the above-mentioned instinct would not be dimmed. Once again we are an entity. Just about a year ago the spirit moved Mr. H. D. Ainlay and sundry others to re-organize. With the principle laid down that there had to be "eats" at each meeting, the success of the club was assured. Maybe that was an item omitted from the agenda, ten years ago.

Speaking with modesty for the Executive, we feel that the programmes have always been sufficiently varied to be spicy. We gather in a hotel and sit down to a sumptuous repast. Our wit sharpens with the dulling of appetite. Everybody is in a good humor. Unlike Tommy Tucker, we sing *after* supper and with no hope either of getting any more or finding a place for it if we did. Then Mr. Fleming, our chairman, calls upon the distinguished guest of honor of the evening. Our speakers—Prof. Alexander, Mr. T. E. Hughes, Mr. John Blue and Hon. J. F. Lymburn—like Ulysses, have all been "—bringers of new things" and have entertained us delightfully. After speaking they usually excuse themselves and then we revert to mundane things—engaging in discussions and passing resolutions of weighty import. Newcomers on the staff, if present, are introduced and invited to make themselves at home.

Our final meeting took the form of a banquet in the King Edward Rose Room, on the evening of May 21st. The superintendent, the board members, and



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our partners were the guests of honor. Originally, the minutes were worded so as to give male teachers the privilege of bringing their wives or lady friends; but since certain ambiguities in meaning were suggested, of grave moral potency, they were finally reworded in the singular—"each teacher to bring his wife or lady friend"—and Mrs. Grundy turned back to her knitting (?) disappointed (It's little things like this that make or break an organization). Sixty-four, all told, sat down; we dined soberly, but well. I wish I could remember half the clever things the speakers said. We heard from Messrs. Humphreys, Elliott, Ottewell, McKee, Cushing, Clayton, Barnes and Crang. That the board members might fall victims to that dread disease—enlargement of the heart—was the thought voiced by Mr. Elliott. A happy note was struck by Mr. Clayton, who expressed the appreciation of the teachers for the privilege, granted some time ago, of being represented at all Board and Committee meetings. The speeches were interspersed by vocal and instrumental numbers. One hit of the evening involved a house-fly, a Westmount teacher, a lump of sugar cunningly used as a bait, and a swatter ingeniously improvised from a serviette. The "swat!" put a period in one of the speeches where none was needed, but the presence of a substantial pillar saved the interrupter the embarrassment of discovery.

The dinner and social evening elicited praises from everybody. We feel, too, that such an event is a splendid basis for a continuance of the harmonious co-operation already established between ourselves and the Board.

The club has been functioning for a year now. We have found it a medium of intercourse of great social value. Like the phoenix, a new executive will arise, next fall, from the ashes of the old. We bespeak for them enthusiastic support, believing that the members will find the club's activities, under their direction, both entertaining and profitable.

ALEX. STOCKWELL.

Correspondence

CHRISTIAN SCIENCE COMMITTEE ON PUBLICATION
533 TEGLER BUILDING, EDMONTON, ALBERTA

June 13, 1930.

Editor,

A.T.A. Magazine,

Edmonton, Alberta.

In an article published in the May number of the *A.T.A. Magazine*, the writer makes some references to Christian Science which call for comment and correction. His article is intended to be humorous, and it is not likely that all of it will be taken very seriously. However, as your magazine is reaching many who are giving instruction to young pupils, it is well that a corrective and explanatory statement should be published, so as to check any wrong impression about the teaching of Christian Science.

The writer acknowledges very properly that "Christian Science does a great deal of good," a fact which is obvious to every thoughtful and fair-minded person.

The writer indicates that there is a vast difference between Christian Science and behaviorism. This

is true; but in drawing his contrasts he makes statements about Christian Science which are inadequate and misleading. His statement, "the Christian Scientist denies the body," does not adequately express the teaching of Christian Science. While the Christian Scientist denies the reality of matter on the basis of the allness of divine Mind and its manifestation, he begins by denying diseases in the body, rather than by denying the body itself. This is a good beginning, and it leads on to higher attainment in the demonstration of spiritual law.

The statement, "the Christian Scientist says that everything comes from within," is not correct. Christian Science teaches that all that is good comes from God, the divine Mind, and that good only is real and true. The evil suggestions which an individual may need to overcome do not necessarily originate in the thought of this individual. His protection from such suggestions does, however, lie in the Christian state of mind which he strives to maintain. Thus he proves that his defense against evil suggestions is in God.

Instead of arguing one into a corner and leaving one there, as the writer of this article states, Christian Science has brought many a one out of difficulties, and this is the normal result of a progressive understanding of Christian Science. This teaching is being successfully utilized in the healing of physical disease and in the solving of human problems, because it imparts a practical understanding of God and of man.

PETER B. BIGGINS,

Christian Science Committee on Publication.

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The *Edmonton Journal* and the *Alberta Farm Journal* carries more "Teachers Wanted" advertisements than any other paper in Alberta. If you are looking for a school, or desire a change read and use the classified columns of the daily *Journal* and *Alberta Farm Journal*.

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So that the boys and girls in your school district may have the utmost training during the ensuing term select a competent teacher by advertising in the *Edmonton Journal* and *Alberta Farm Journal*.

Men and women of character whose interest and qualifications mean much to the children of your district will reply to your advertisement.

If you are building a new school this year save money by advertising for tenders in a paper that reaches all the worthwhile contractors in central and northern Alberta.

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